

Appendix F

Structures Visual Inspection Forms

1 Introduction

The results of the upper reach structures field inspection, visual observation, and evaluation are detailed in the facility condition assessment (FCA) reports included in this appendix. Types of structures that were inspected are identified in Table F-1. The attached FCA reports include the following:

- Facility name and property information, where known
- Facility identification – ST (Structures) and OF (Outfalls)
- WUS# – Waterway User Survey identification number
- Location – River mile, station, and side of river
- Relevant background information, photographs, and description of observed presence or absence of defects or deficiencies in individual elements of the structure
- Overall structure rating (not considering landside inspection that may be conducted)
- Accessibility for field investigation, construction equipment, and remediation activities
- Observed hazards
- Material inspection checklist form and element condition rating

The overall structure ratings provide a general assessment of the structures' conditions, not an indication of their strength to support their intended design load or functional use. Overall ratings are based on American Society of Civil Engineers Manual of Practice No. 101 (Childs 2001) and are categorized as follows:

- **Good:** Structure has no significant problems and only minor defects/deficiencies were noted.
- **Satisfactory:** Structure has minor to moderate defects/deficiencies.
- **Fair:** Structure has minor to moderate defects/deficiencies, but all primary structural elements remain in sound condition. Localized areas of moderate to major defects and/or deterioration may be present but do not significantly reduce the load-bearing capacity of the structure.
- **Poor:** Structure has major severe defects/deficiencies and/or deterioration is observed on widespread portions of the structure.
- **Serious:** Structure has severe defects; deterioration, overstressing, and/or breakage is observed on primary structural elements. Localized failures are observed or possible to occur.
- **Critical:** Structure has severe defects/deficiencies, deterioration, overstressing, and/or breakage that has resulted in localized failures of primary structural elements. Widespread failures are possible or likely to occur.

The overall structure ratings for ST-01 through ST-21 are summarized in Table F-1. Structures ratings are not provided for outfalls (OF-01 through OF-26).

Table F-1
Summary of Structure Conditions

| Facility ID | WUS # | Facility Name or Description | Asset Type | Condition Assessment |
|-------------|-------|--------------------------------------------------|---------------------------------------------------------|----------------------|
| ST01 | 38 | Boeing Plant 2 | Pile Supported Building | Satisfactory |
| ST02 | 57 | South Park Bridge (16th Ave S Bridge) | Vehicular Bridge, Abutment, Piers, Fender Piles | Good |
| ST03 | 65 | Star Forge, Boeing, Central Properties | Bulkheads | Fair |
| ST04 | 41 | Northwest Container Services | Dolphin | Serious |
| ST05 | 44 | Boeing Wharf (Slip 6) | Wharf, Piers | Poor |
| ST06 | 50 | Overhead Power Line Crossing | Overhead Crossing | Satisfactory |
| ST07 | 66 | Timber Groins and Wharf | Wharf, Groins, Riprap, Platform | Poor |
| ST08 | 16 | S 98th Street (Boeing) Bridge | Vehicular Bridge, Piers, Abutment | Good |
| ST09 | | Miscellaneous Bulkhead - 1 | Bulkheads | Poor |
| ST10 | | Miscellaneous Piles - 1 | Pile Field | Poor |
| ST11 | | Miscellaneous Piles - 2 | Pile Field | Poor |
| ST12 | 43 | Delta Marine Industries | Wharf, Pier, Riprap, Bulkhead, Floats, Debris Deflector | Good |
| ST13 | | Breakwater | Timber Breakwater | Fair |
| ST14 | | Travel Lift Pier | Boat Lift | Satisfactory |
| ST15 | 42 | Duwamish Yacht Club | Marina, Bulkhead, Guide Piles | Fair |
| ST16 | 40 | Kelly Ryan (McElroy George and Assoc., Inc) Pier | Pier | Fair |
| ST17 | | Miscellaneous Piles - 3 | Pile Field | Poor |
| ST18 | | Miscellaneous Piles - 4 | Pile Field | Poor |
| ST19 | 6 | T-117 Cleanup Site | Bulkhead, Debris Barrier, Float | Good |
| ST20 | 39 | South Park Marina | Marina, Bulkhead, Guide Piles | Fair |
| ST21 | | Miscellaneous Piles - 5 | Pile Field | Poor |

Notes:

ID: identification

T-117: Terminal 117

In addition to overall structure ratings, the FCA reports for structures include a material conditions rating, which is a general description of the condition of primary materials used in the construction of a structure (e.g., timber, concrete, steel). Material conditions rating indicates whether a structural element has lost any of its design area (i.e., loss of material cross section) that can change the engineering properties of the structural element. Again, these ratings provide a general assessment of the structural element or component integrity and are not an indication of the structures' strengths to support their intended design load or functional use. Materials condition ratings for each observed structure are categorized as follows:

- **Excellent:** New or near-new condition; no loss of material cross section.
- **Good:** No significant issues or concerns; <5% loss of material cross section.
- **Fair:** Some wear observed but no significant issues/concerns; between 5% and 20% loss of material cross section.
- **Poor:** Significant wear observed; between 20% and 50% loss of cross section.
- **Critical:** Extremely worn or damaged; between 50% and 80% loss of cross section.

2 References

Childs, KM. 2001. *Underwater Investigations: Standard Practice Manual*. American Society of Civil Engineers.

3 Attachments

| | |
|----------------|-------------------------|
| Attachment F-1 | FCA Reports: Structures |
| Attachment F-2 | FCA Reports: Outfalls |

Appendix F

Attachment F-1 FCA Reports: Structures

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/11/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST01
Boeing Plant 2
Parcel No. 218000005, 220000005

WUS#: 38

Facility Location: River Mile 3.0
Direction (side) East
STA 254+00 to STA 264+00

Asset Type: Pile-Supported Building

Use: Historical Overwater Buildings,
Warehouse

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview
Image Capture: Aug 2019 ©Google

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Timber pile-supported building on concrete deck and a timber pile-supported concrete apron on the north end
- The entire west face of the fendering piles is lagged with timber. At south and north end sections of the building, rubber sheets cover the piles. It is unknown if the lagging exist in these areas. It appears that the lagging serves as skirting rather than retaining.
- The toe of the shoreline in front of the fender piles is armored with riprap and concrete panel rubble.
- The slope beyond the fender pile are armored with riprap.
- There is moss on the surfaces of lagging and pile sections in the wet/dry zone. The condition of the lagging and piles cannot be determined.

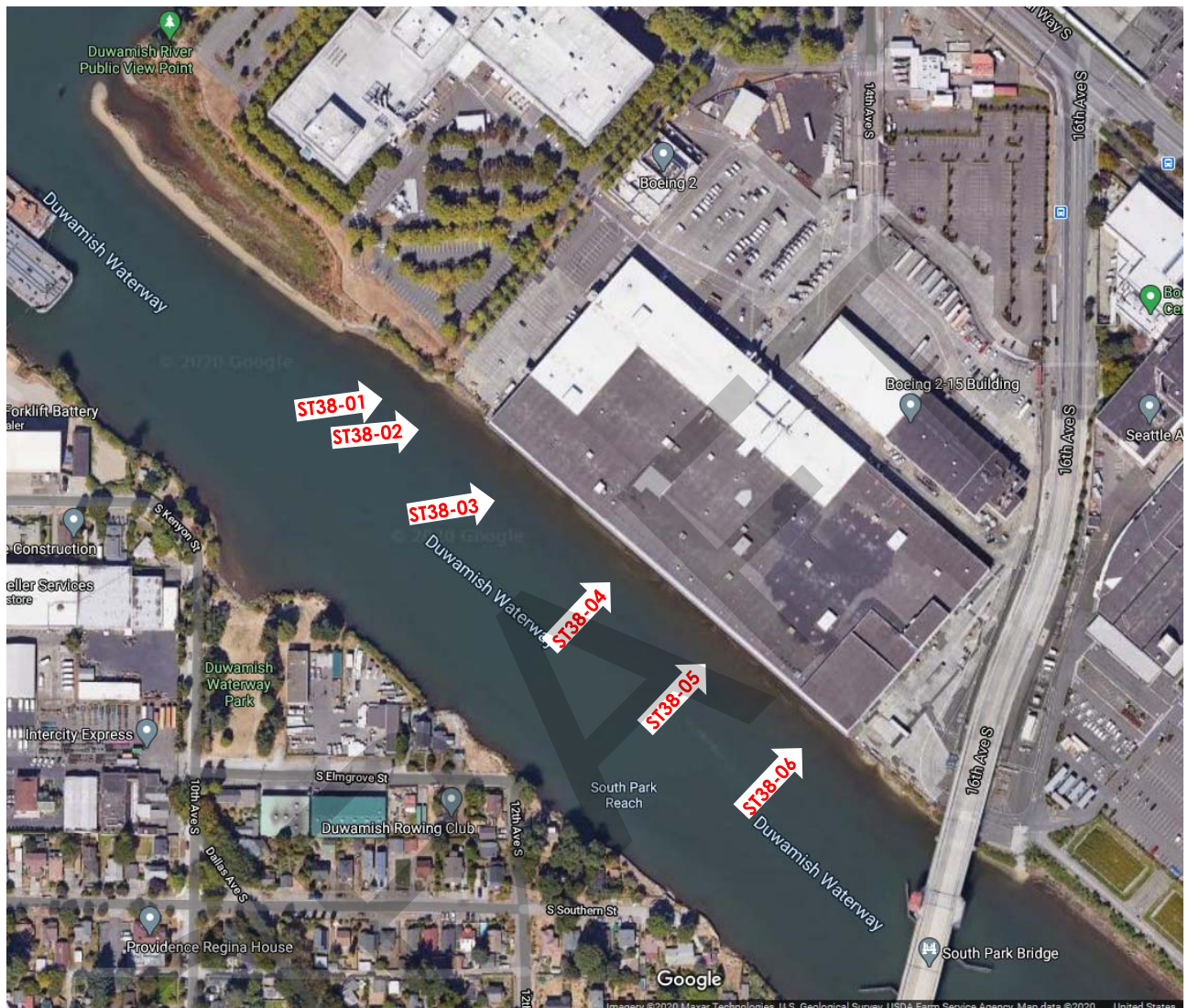
Accessibility:

- The timber lagging and fender piles are accessible from the water side.
- Lagging and steel chainlink fabric fender piles prevent access to piles beyond.

Potential Hazards:

- No overhead structures were observed along the face of the bulkhead.

VICINITY MAP



PHOTOGRAPHS

North Apron

Timber Lagging



Photo ST38-01: North End (Looking East)



Photo ST38-02: North End of Building

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Photo ST38-03: Mid to South End of Building



Photo ST38-04: Mid Section of Building

PHOTOGRAPHS



Photo ST38-05: South End of Building



Photo ST38-06: South Apron

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/11/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST02
South Park Bridge (16th Ave S Bridge)
Parcel No. _____

WUS#: 57

Facility Location: River Mile 3.3

Direction (side) Both

STA 266+50 and STA 502+30

Asset Type: Bascule Bridge

Use: Vehicular Bridge

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Each end of the main span of the Bascule Bridge is supported on a concrete Bascule pier within the navigation channel (Photo 1).
- Fender pipe system on the navigable channel-side of the Bascule piers (Photos 1 and 2).
- The east and west approach spans are supported on concrete bents outside the waterway (Photos 1, 3, and 4).
- East and west shoreline embankments are protected with riprap (Photos 3 and 4).
- The concrete surface of the Bascule piers appears to be in good condition, except for some scattered marine growth in the tidal zone (Photos 5, 6, and 7). No damage was observed.

Accessibility:

- Elements around the Bascule piers are accessible, but may be limited outside the navigable channel.
- Vessel size may be limited when the Bascule Bridge is in the closed position.

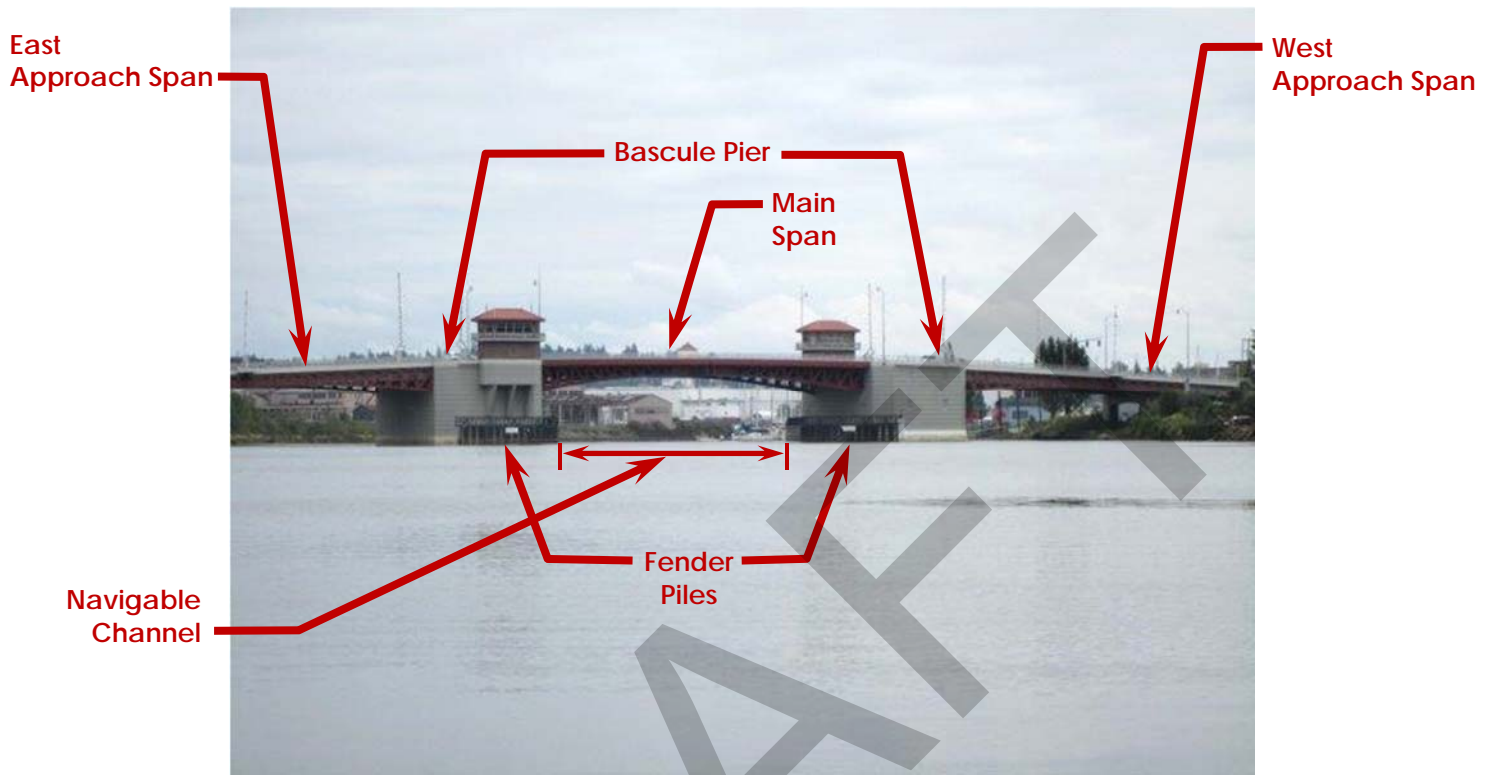
Potential Hazards:

- Vessel clearance outside the navigation channel.

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ST02-01: Bridge Main Span



ST02-02: Fendering System

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ST02-03: East Bent



ST02-04: West Bent

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ST02-05: West Bascule Pier (south)



ST02-06: West Bascule Pier (east side)

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ST02-07: West Bascule Pier (southeast side)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/11/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST03
Star Forge, Boeing, and Central Properties
Parcel Nos. 1600020, 1600023, 1600014,
7400053, 54226000060

WUS#: 65

Facility Location: River Mile 3.5 to 4.0

Direction (side) East

STA 283+50 to STA 308+00



Site Overview

Asset Type: Steel Sheet Pile Bulkhead

Use: Cleanup Containment

Inspection Date: July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Starting from the north (downstream) end, this structure consists of a series of riprap along this stretch of shoreline and bulkheads (segments), including:
 - Riprap shoreline protection (Photo 1).
 - Steel sheet pile bulkhead (Photo 2).
 - Riprap shoreline protection (Photos 3 and 4).
 - Steel sheet pipe bulkhead (Photo 5).
 - Steel H-pile bulkhead with a wide variety of lagging, concrete panels, cross bracing, remnant concrete panel rubbles, timber (Photos 6 to 13).
 - Tied back steel sheet piles with timber fender pile (Photos 14 and 15).
 - Steel sheet pile bulkhead with timber fender pile (Photo 16).
 - Steel sheet pile bulkhead (Photos 17 and 18).
 - Timber piles and lagging (Photo 19).
- Close observation was not possible. However, except for the two relatively new segments of steel pile bulkheads (Photos 2, 6, and 7) which appear to be in good condition, the remainder of the bulkhead segments are in various states of indetermination.

Accessibility:

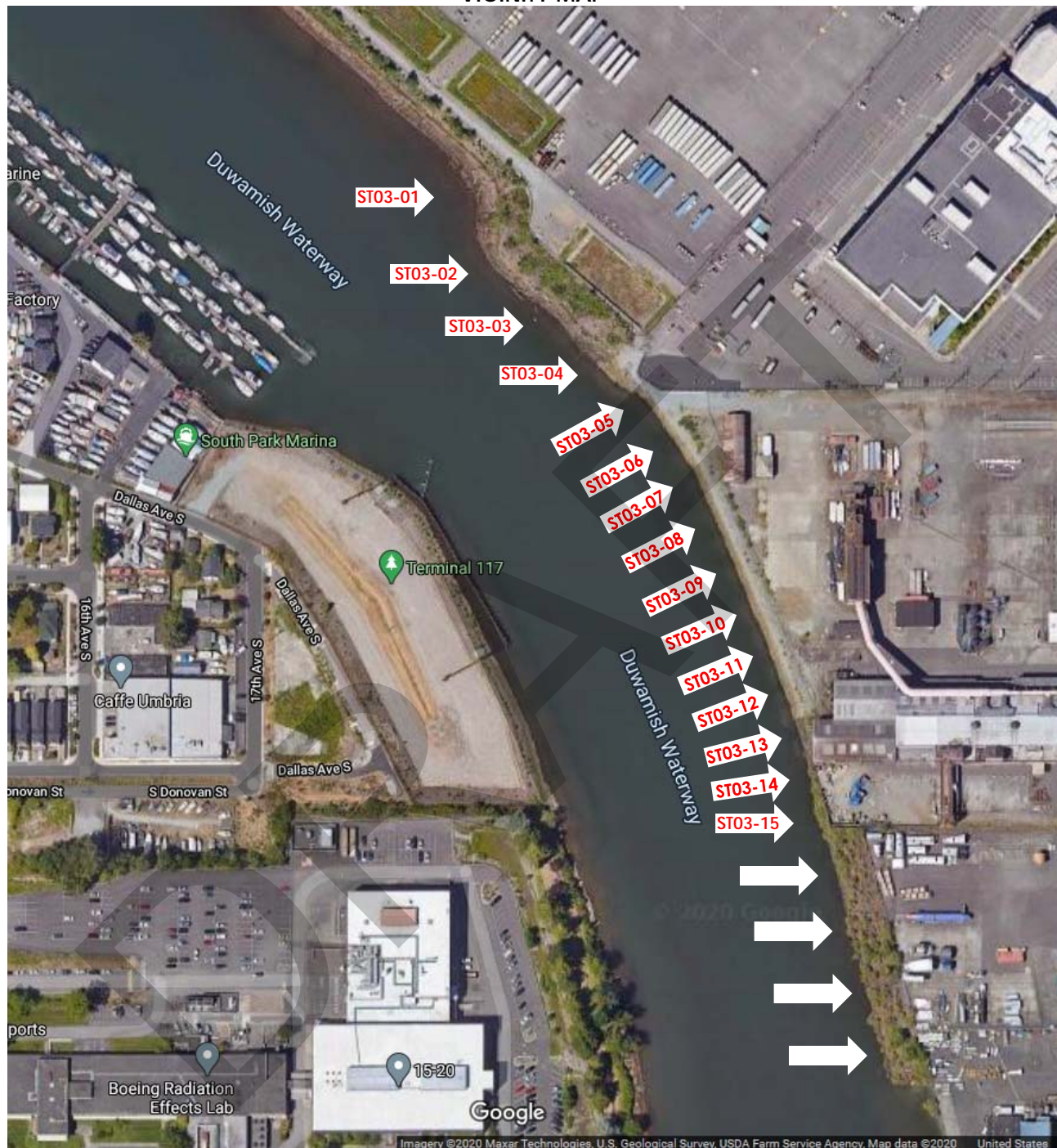
- The structure is all in-water and is accessible from the water side.

Potential Hazards:

- There are no overhead or underwater structures observed.
- Stability of segments of the bulkhead may be questionable.

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Photo ST03-01: Riprap Section



Photo ST03-02: Sheet Pile Bulkhead Section

PHOTOGRAPHS



Photo ST03-03: Riprap Section



Photo ST03-04: Riprap Section

PHOTOGRAPHS



Photo ST03-05: Sheet Pile Bulkhead (north end)

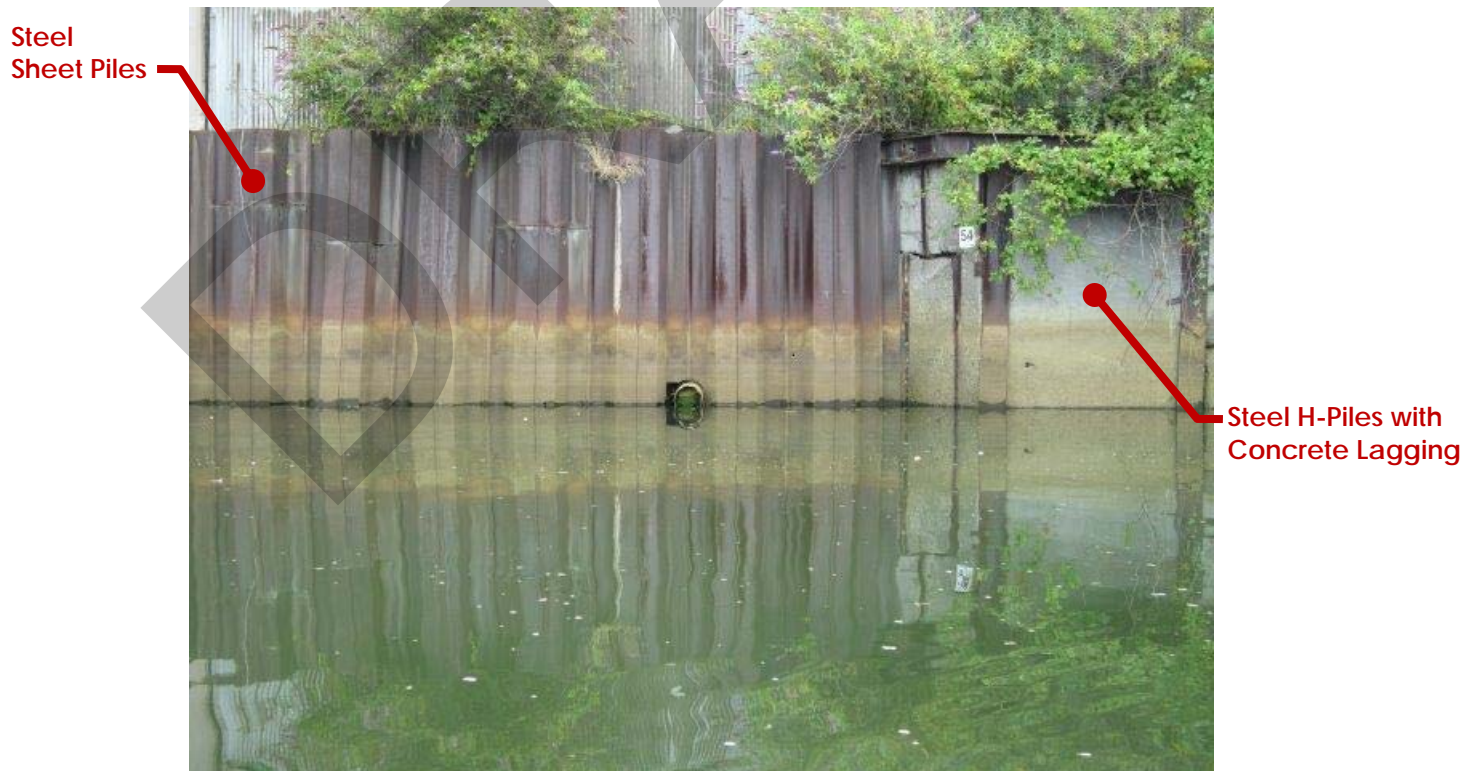


Photo ST03-06: Sheet Piles (south end)

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Photo ST03-07: H-Piles with Concrete Lagging (south end)



Concrete Panel

Photo ST03-08: H-Piles with Concrete Panels

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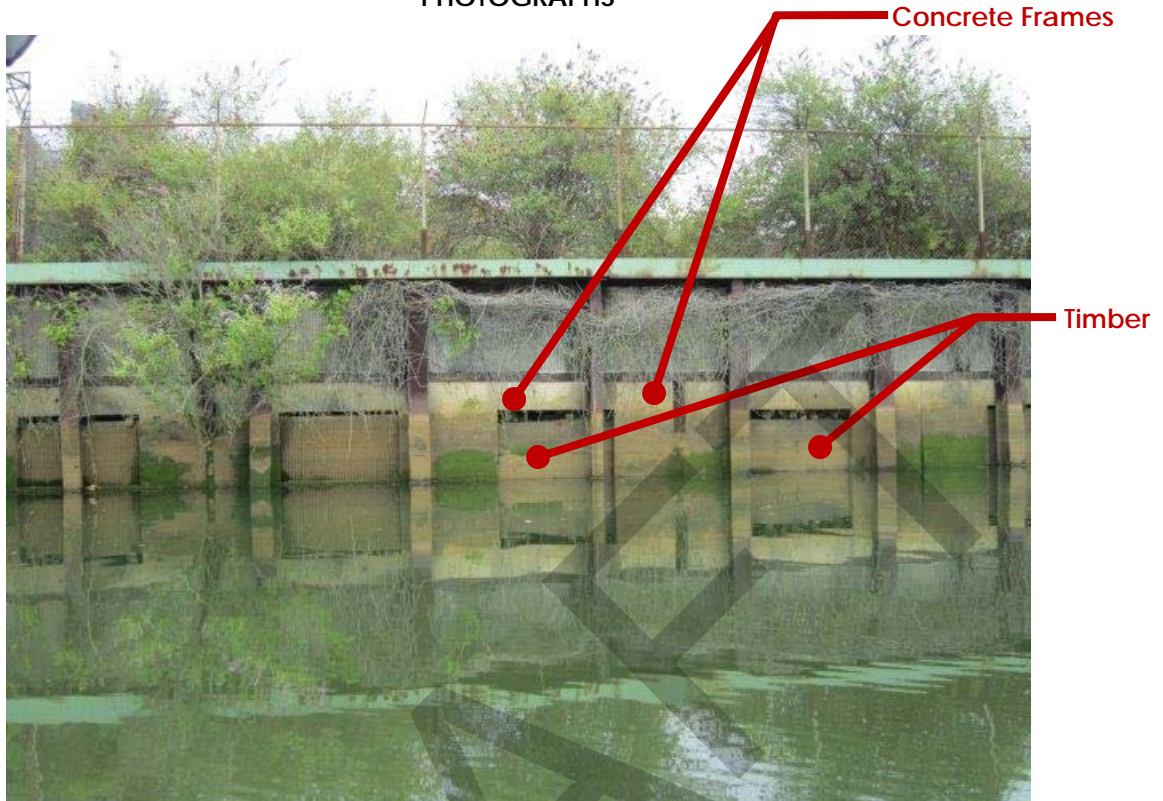


Photo ST03-09: H-Piles with Concrete Panel Rubbles



Photo ST03-10: H-Piles with Concrete Panel Rubbles

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Concrete Panel Rubbles



Photo ST03-11: H-Piles with Concrete Panel Rubbles

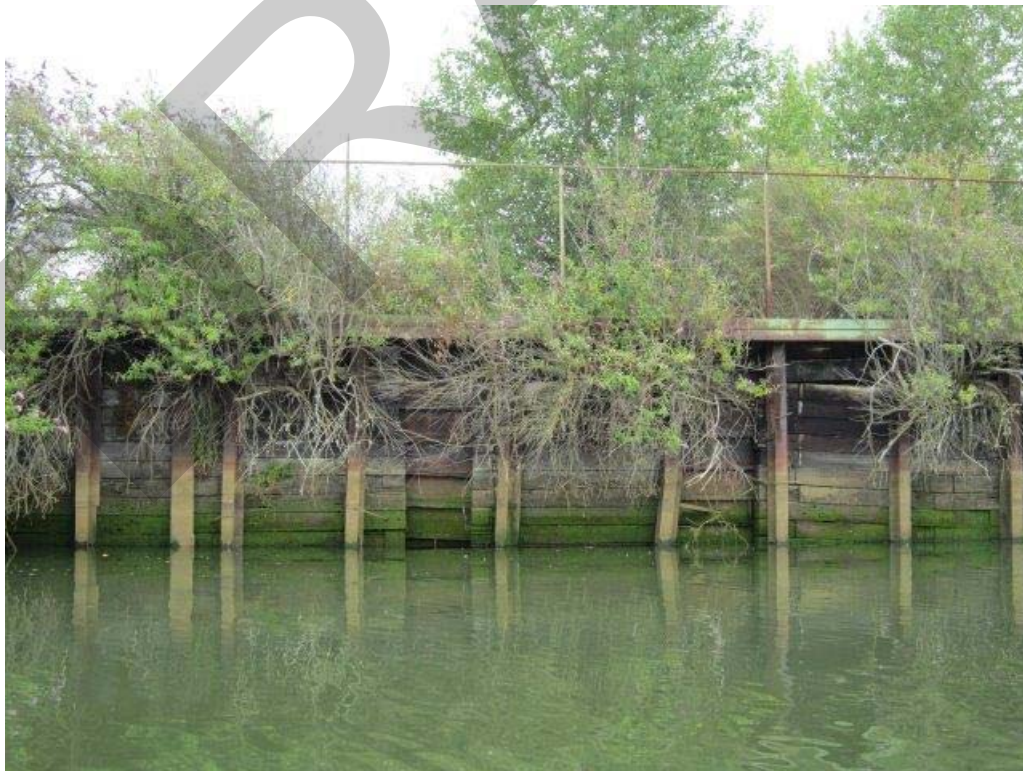


Photo ST03-12: H-Piles with Timber Lagging

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Photo ST03-13: H-Pile with Timber Lagging

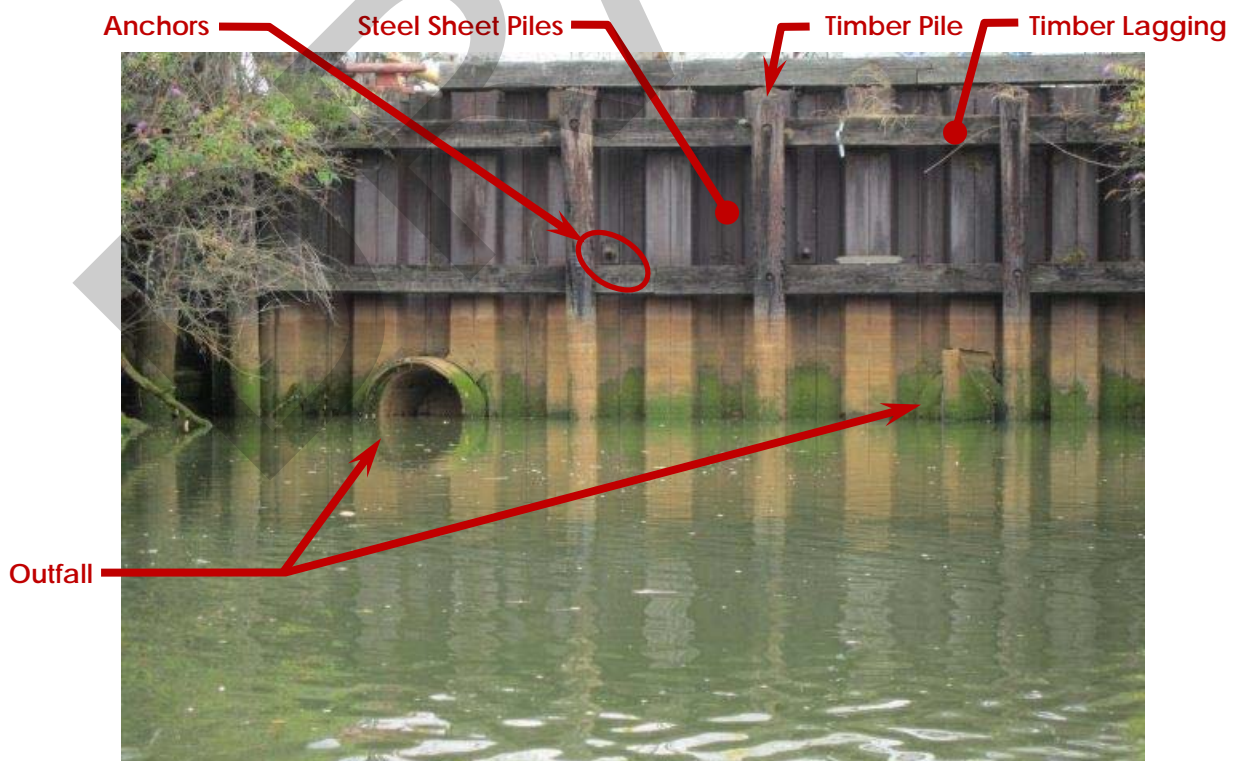


Photo ST03-14: Hybrid Tie-back Bulkhead

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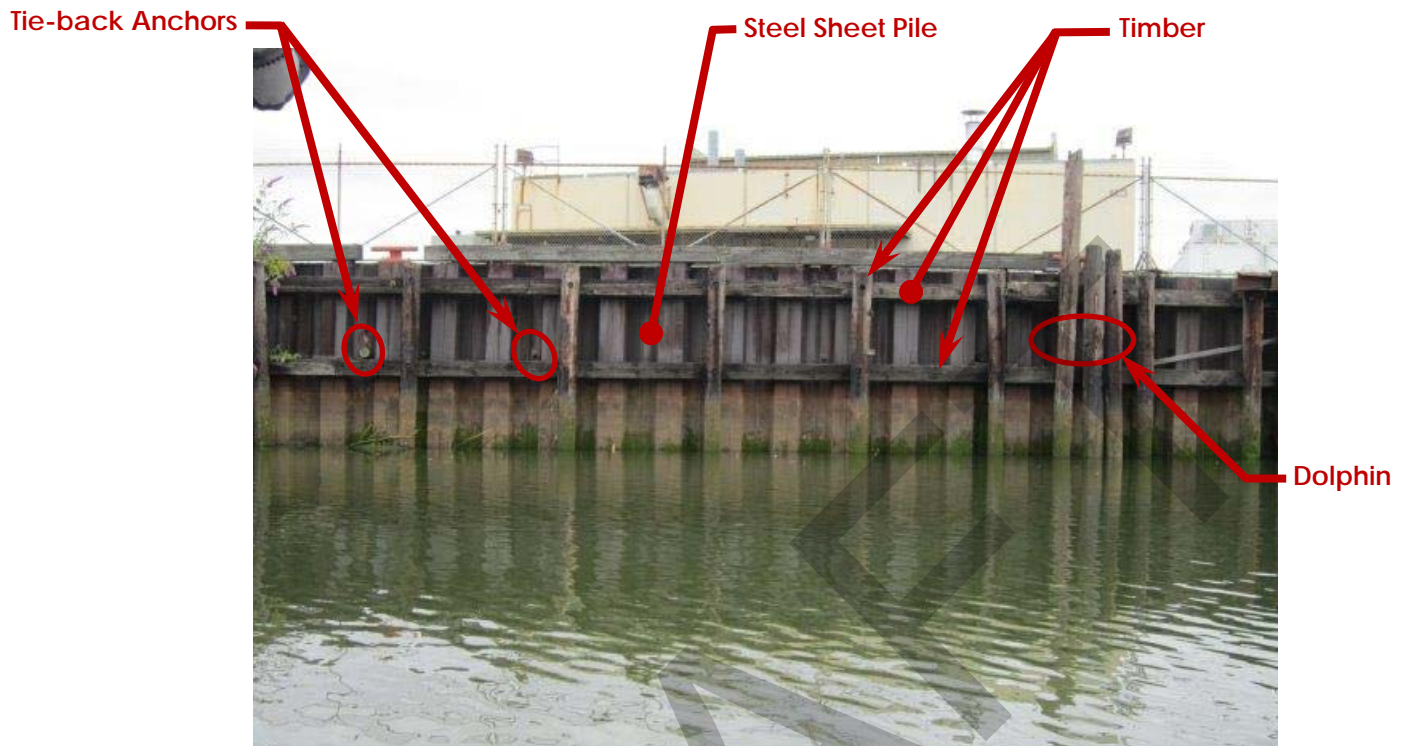


Photo ST03-15: Hybrid Tie-back Bulkhead (north end)



Photo ST03-16: Hybrid Bulkhead (south end)

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Photo ST03-17: Sheet Pile Bulkhead (south end)



Photo ST03-18: Sheet Pile Bulkhead (north end)

PHOTOGRAPHS

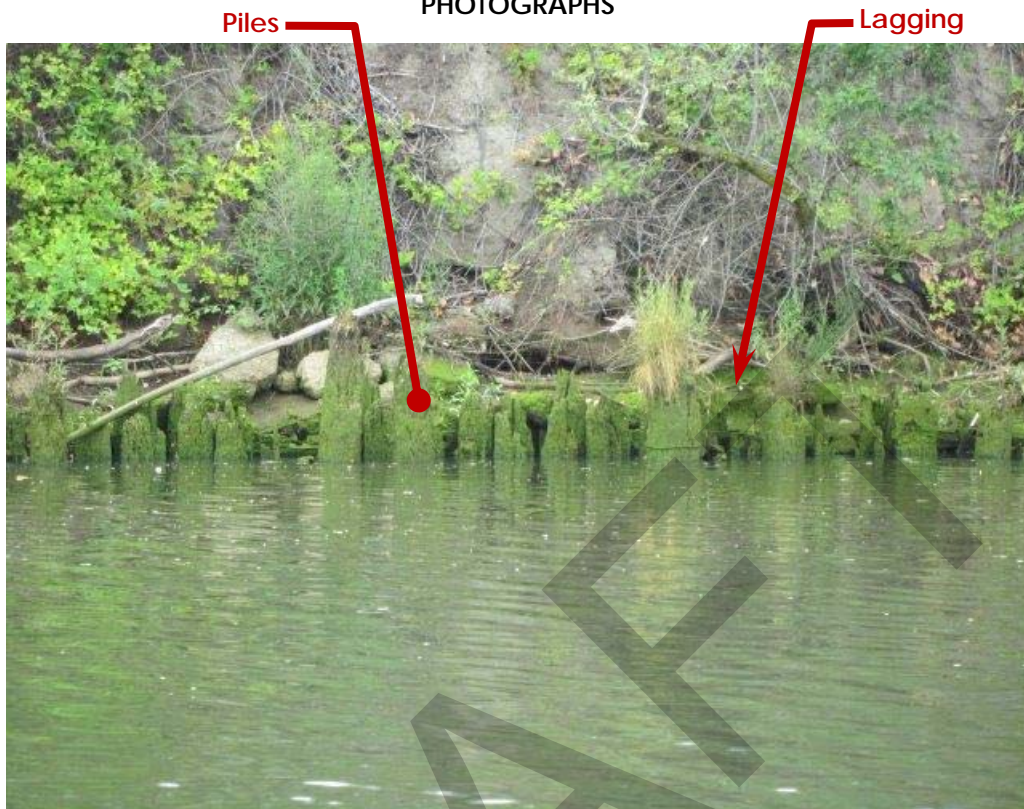


Photo ST03-19: Timber Pile and Lagging

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/11/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST04
Northwest Container Services
Parcel No. 5422600010

WUS#: 41

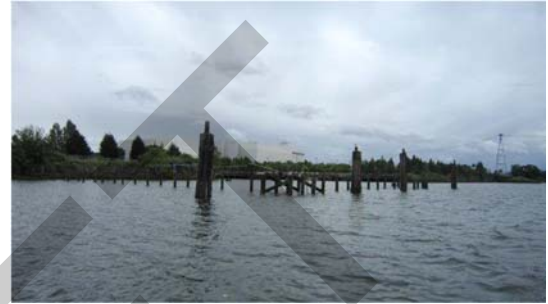
Facility Location: River Mile 4.0
Direction (side) East
STA 308+00 to STA 318+00

Asset Type: Dolphins

Use: Barge Moorage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☒ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- L-shaped pier of two (2) timber pile bents – One (1) leg extends west from the shore and the other offshore leg extends to the south.
- The pier is delapidated – Several piles are missing
- Along the south and west side of the pier are several 7-timber pile dolphins. The dolphins are still in use and are missing piles.
- The condition of the piles could not be assessed.

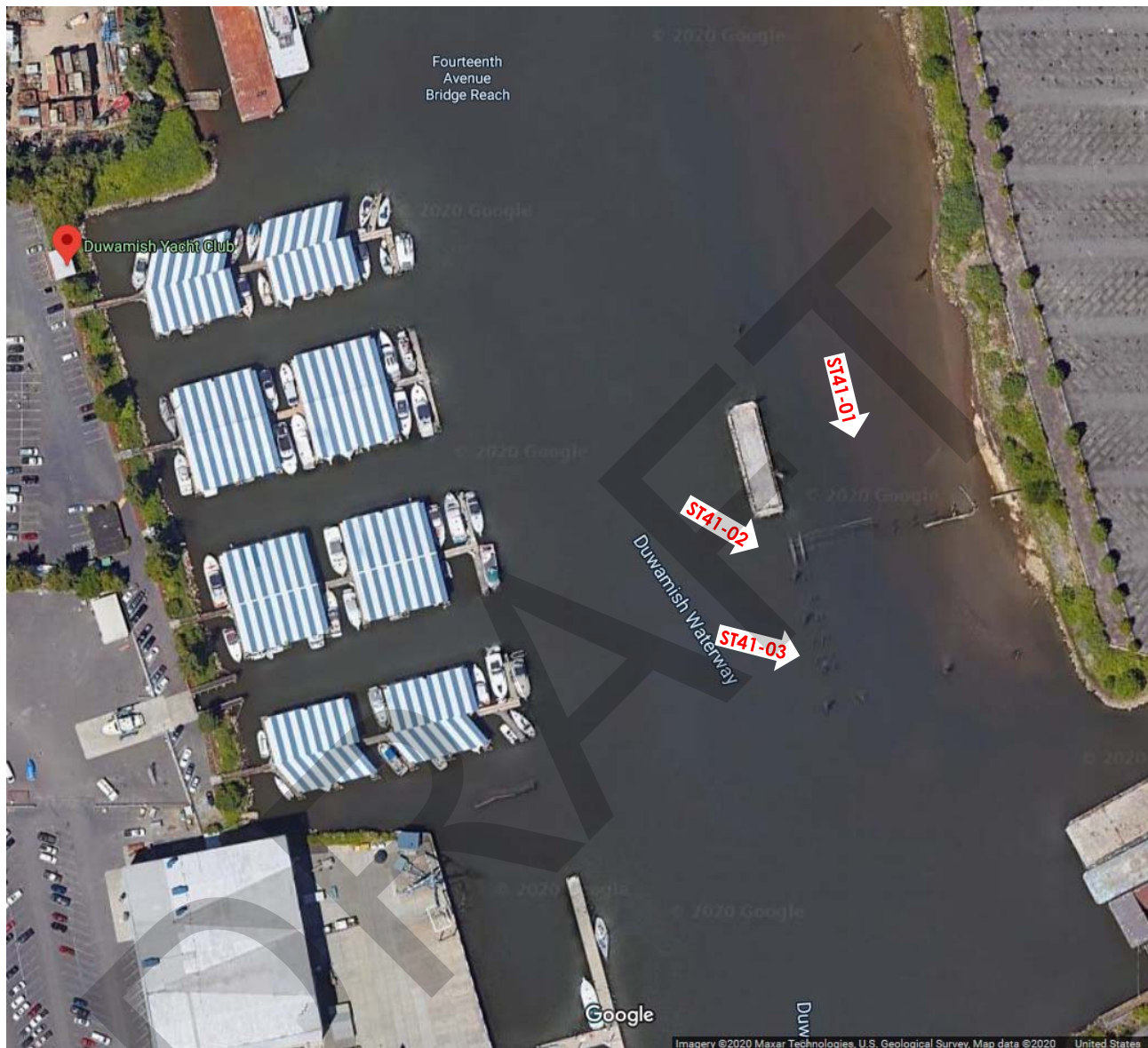
Accessibility:

- The structure is mostly inaccessible from all directions; limited by pile spacing.

Potential Hazards:

- Some of the piles may be unstable.

VICINITY MAP



PHOTOGRAPHS



Photo ST41-01: L-Shaped Pier and Dolphins (Looking South)



Photo ST41-02: L-Shaped Pier and Dolphins (Looking South)

PHOTOGRAPHS



Photo ST41-03: South End of Pier

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/11/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST05
The Boeing Company Seattle Wharf (Slip 6)
Parcel No. 5624201032

WUS#: 44

Facility Location: River Mile 4.2

Direction (side) East

STA 318+00 to STA 341+00

Asset Type: Wharf – 6 Concrete Piers

Use: Barge mooring

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were done on the deck at this site.

Structure consists of six (6) concrete piers slipway along the south river bank. Each pier is approximately 60-ft long (in the N-S Direction) and typically composed of:

- Two (2) rows of a combination of five (5) vertical and battered octagonal prestressed concrete piles.
- 36" wide x 42" deep concrete pile cap spaces at approximately 21-ft.
- Nine (9) precast concrete haunched pier decks.
- Four (4) sets of timber fender piles on the north face.

Along the south bank and between the piers is a concrete apron supported on two (2) rows of seven (7) prestressed concrete octagonal piles, concrete cap beams, and concrete deck. The apron structure was not accessible and therefore the size and spacing of the members were not measured. The apron appears to be used for mooring.

The bank is protected with concrete bulkhead and riprap at the toe of the bulkhead/bank.

Pier 1 (East Most)

- The timber fender piles are generally intact except for the loose or missing straps. (Photos 1 and 2) The top of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.

- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles (Photos 3 and 5).
- Along the length of the lower part of the pile cap is a crack. This is typical on all pile caps. (Photo 5)
- The pile caps are in good condition except for a loose concrete spall on the east face near the top of the cap and (b) mortar surface erosion in the splash zone (Photos 3 and 4).
- Pier decks are in good condition except for corrosion of exposed reinforcing bar in one of the panels (3rd panel from the north) and some rust stains between the 4th and 5th panel (Photos 6 and 7).

Pier 2

- Several timber fender piles are missing, broken, damaged, or missing straps. (Photos 9 and 10) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The cap beams are in good condition except damage to the top of the west cap that exposes some reinforcing steel (Photos 10 and 11).
- The pier decks are in good condition except for portion of the west side of the first concrete deck panel is broken or partially demolished exposing some reinforcing bars (Photos 12 and 13).

Pier 3

- Several timber fender piles missing with some loose or missing straps. (Photo 15) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The pile caps are in good condition except for the north end of the east cap beam is wider and the west pile cap is deeper than the typical cap configuration (Photos 15 and 16).
- Concrete pier decks are in good condition (Photo 17).

Pier 4

- A few timber fender piles missing with some loose or missing straps. (Photo 19) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The pile caps are in good condition except for the pile caps are approximately 32" wide x 42" deep and the depth of the west cap over the first pile is deeper than typical.
- Concrete pier decks are in good condition (Photo 20).

Pier 5

- Several timber fender piles missing or broken with some loose or missing straps. (Photo 22) The tops of several piles appear to be rotted due to weather exposure and subsequent vegetation growth. The

body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.

- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles. The top 6-in of the first pile to the east appears to be field built up and contains rock pockets (Photo 23).
- The pile caps are in good condition except for the pile caps are 32" wide x 42" deep, wider than typical dimensions.
- Concrete pier decks are in good condition (Photo 24)

Pier 6 (West Most)

- Most timber fender piles are missing, broken, or damaged. Some with loose, damaged, or missing straps (Photos 26 and 27). The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles (Photos 28 and 29).
- The pile caps are in good condition except for the pile caps are wider than typical dimensions (Photos 28 and 29).
- Concrete pier decks are in good condition except for damage at top west corner with broken concrete and exposed reinforcing steel (Photos 27 to 29).

Wharves

- Wharves are located between all piers and extend westward past Pier 6; there is not a wharf east of Pier 1.
- Appears to be in good condition, no damage was observed.

Accessibility:

- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- Each of the piers are accessible along the east and west sides. Access to the north sides are obstructed by the fender piles.
- Wharf is accessible by vessel, but not beyond the outboard concrete piles.

Potential Hazard:

Pier 1

- a) Falling debris hazard due to loose concrete spall (Photos 3 and 4).
- b) Rot and decay at top of fender piles.
- c) Loose fender pile straps.
- d) Snag hazard due to loose mooring lines.

Pier 2

- a) Falling debris hazard due to loose and damaged concrete of the pier deck and the top of deck (Photos 9, 12, and 13)
- b) Snag hazard due to loose mooring lines (Photos 9 and 10).

- c) Unprotected end of exposed reinforcing steel (Photo 11).
- d) Loose fender pile straps.
- e) It is not known if stub of missing piles exist above mud line.

Pier 3

- a) Rot and decay at top of fender piles.
- b) Loose fender pile straps.
- c) It is not known if stub of missing piles exist above mud line.
- d) Snag hazard due to loose mooring lines.

Pier 4

- a) Rot and decay at top of fender pile.
- b) Loose fender pile straps.
- c) It is not known if stub of missing piles exist above mud line.
- d) Snag hazard due to loose mooring lines.
- e) Hanging Steel Rod in board of west pile cap (Photo 20).

Pier 5

- a) Rot and decay at top of fender piles.
- b) Loose fender pile straps.
- c) It is not known if stub of missing piles exist above mud line.
- d) Snag hazard due to loose mooring lines.

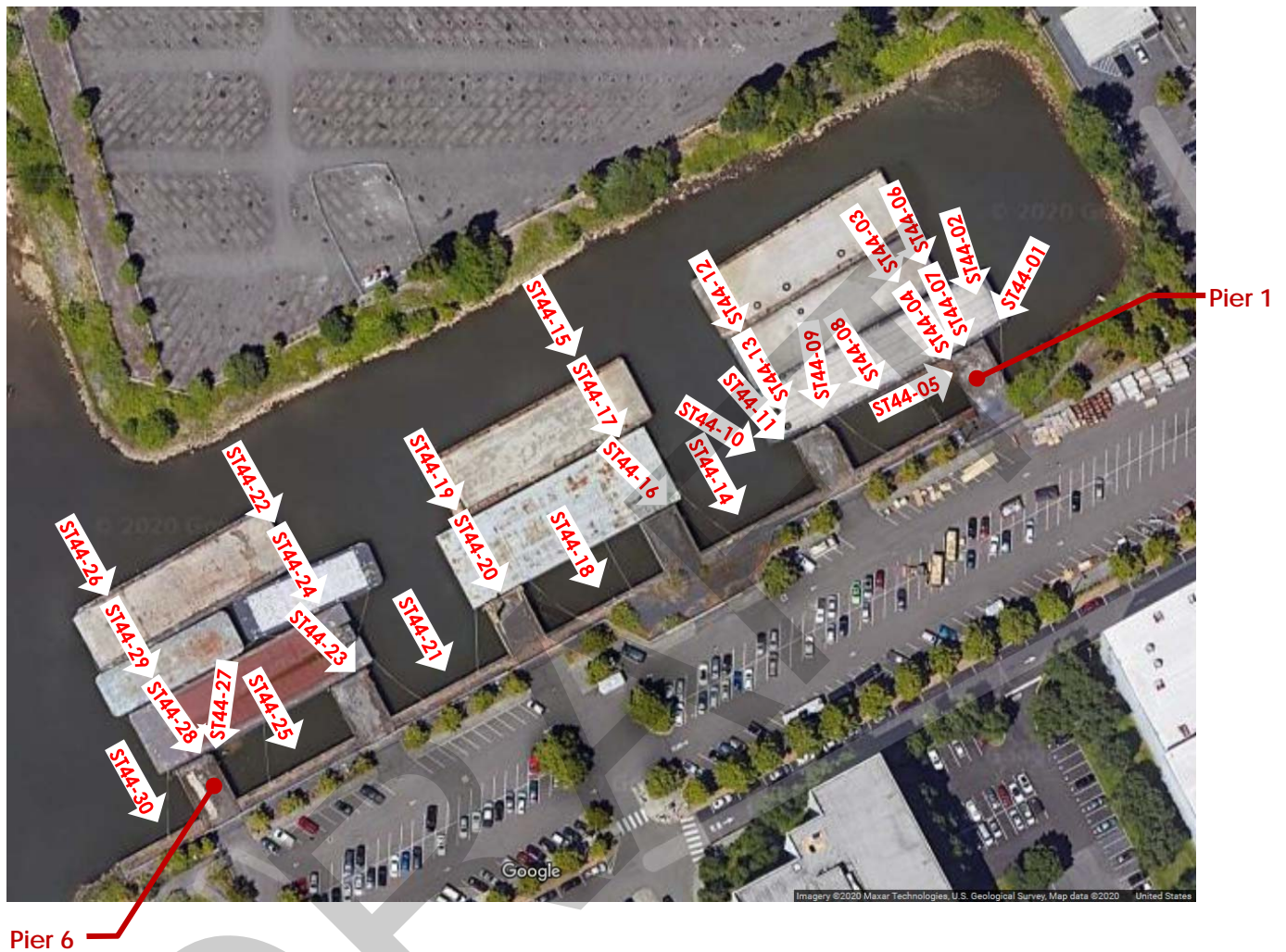
Pier 6

- a) Damaged concrete pier deck with exposed reinforcing steel and unprotected ends.
- b) Rot and decay at top of fender piles.
- c) Loose fender pile straps.
- d) It is not known if stub of missing piles exist above mud line.
- e) Snag hazard due to loose mooring lines.

Wharves

- a) Snag hazard due to loose mooring lines.

VICINITY MAP



PHOTOGRAPHS



Photo ST44-01: Pier 1, East Most (Looking Southwest)



Photo ST44-02: Pier 1 (Looking South)

PHOTOGRAPHS

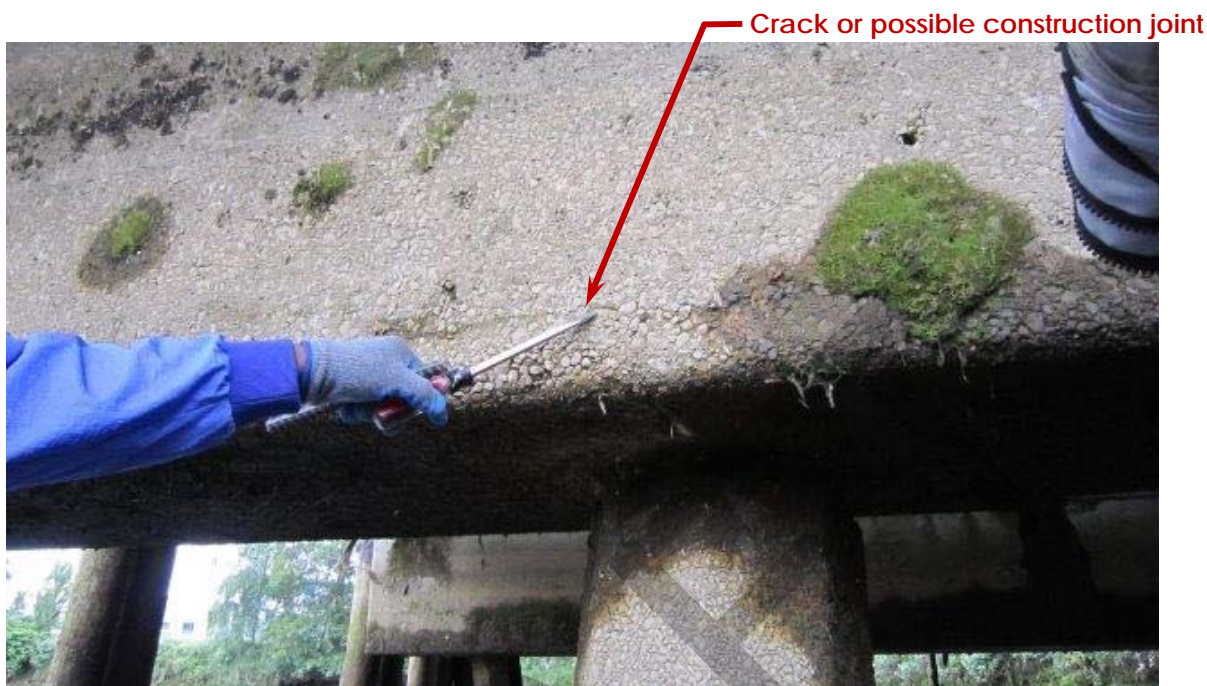


Photo ST44-03: Pier 1, East Side of West Pile Cap



Photo ST44-04: Pier 1, East Side of West Pile Cap

PHOTOGRAPHS



aPhoto ST44-05: Pier 1, West Side of West Pile Cap



Photo ST44-06: Pier 1, Pier Deck Soffit

PHOTOGRAPHS



Photo ST44-07: Close Up of Exposed Reinforcing Bar



Photo ST44-08: Wharf Between Pier 1 and 2

PHOTOGRAPHS



Photo ST44-09: Pier 2



Photo ST44-10: Pier 2 (Looking Southeast)

PHOTOGRAPHS



Photo ST44-11: Pier 2, West Cap Beam



Photo ST44-12: Pier 2, Top West Corner of 1st Deck Panel

PHOTOGRAPHS



Photo ST44-13: Pier 2, Close Up of West Corner of 1st Deck Panel



Photo ST44-14: Wharf Between Pier 2 and Pier 3

PHOTOGRAPHS

Wider Pile Cap

Deeper Pile Cap



Photo ST44-15: Pier 3



Photo ST44-16: Pier 3, East Pile Cap

PHOTOGRAPHS



Photo ST44-17: Pier 3, Pier Deck Soffit



Photo ST44-18: Wharf Between Pier 3 and Pier 4

PHOTOGRAPHS



Photo ST44-19: Pier 4

Hanging Steel Rod



Photo ST44-20: Pier 4, Pier Deck Soffit

PHOTOGRAPHS



Photo ST44-21: Wharf Between Pier 4 and Pier 5



Photo ST44-22: Pier 5

PHOTOGRAPHS



Photo ST44-23: Pier 5, Bent 1 East Cap Beam



Photo ST44-24: Pier 5, Pier Deck Soffit

PHOTOGRAPHS



Photo ST44-25: Wharf Between Pier 5 and Pier 6



Photo ST44-26: Pier 6

PHOTOGRAPHS



Photo ST44-27: Pier 6, East Side

Wider Cap – Over 2 Piles



Photo ST44-28: Pier 6, East Pile Cap

PHOTOGRAPHS



Photo ST44-29: Pier 6, Pier Deck Soffit

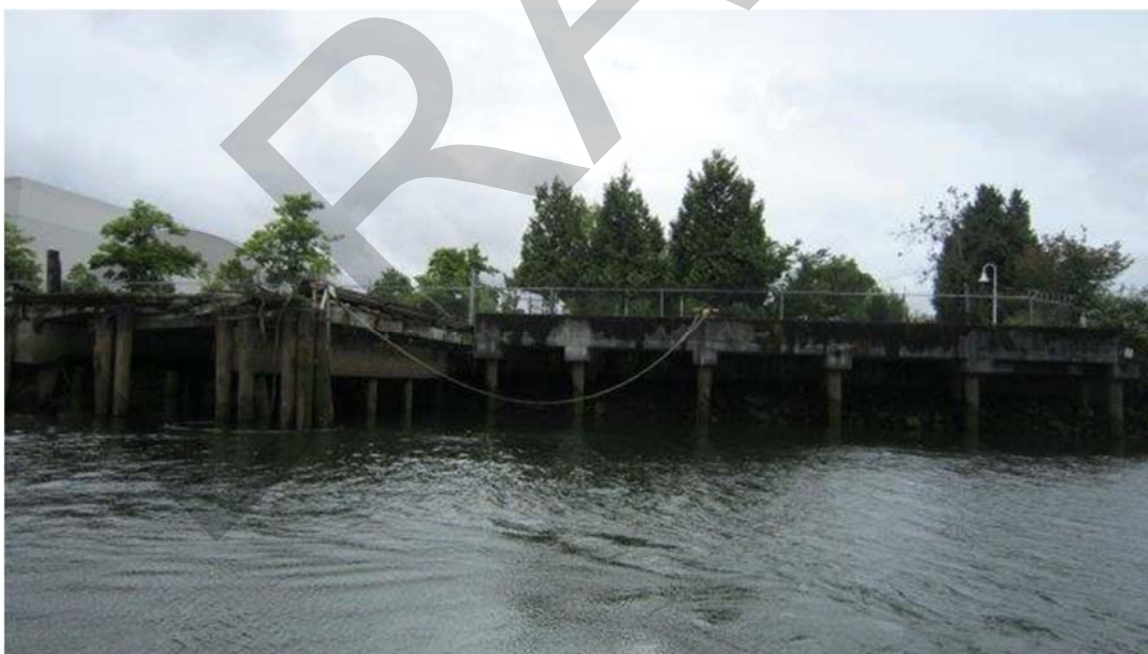


Photo ST44-30: Wharf West of Pier 6

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Drainage | | 1C – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|---------------|---------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Flashing | | Expansive soil |
| | | Freezing and thawing | | Joint sealants | | Compressive soil (settlement) |
| | X | Wetting and drying | | Weepholes | | Evidence of pumping |
| | | Drying under dry atmosphere | | Contour | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Elevation of drains | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, cavitation, impact | | | | |
| | | Heat from adjacent sources | | | | |

| 2. DISTRESS INDICATORS | X | Cracking or Breakage |
|------------------------|---|---------------------------------|
| | X | Staining |
| | X | Surface deposits and exudations |
| | | Leaking |

| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|---|-----------|--|-------------|
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | X | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Formed and finished surfaces – slippery, uneven, or misaligned | | | | X | | | |
| | Cracking | | | | X | | | |
| | Scaling | | | | X | | | |
| | Spalls, pop outs, and delamination | | | | X | | | |
| | Stains, Efflorescence | | | | X | | | |
| | Exposed Reinforcement: Corrosion | | | | X | | | |
| | Damage or distress | | | | X | | | |
| | Missing or broken members | | | | X | | | |
| | Collapse, partial collapse or structure off foundation | | | | X | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | X | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing | | | | X | | | |
| | Curling and warping | | | | X | | | |
| | Erosion | | | | X | | | |
| | Previous Patching or Other Repair: | | | | X | | | |
| | Surface Coatings, Protective Systems, Linings, | | | | | | | |
| | Penetrating Sealers | | | | | | | |
| | Signs of Past Overflow on Rungs and Walls | | | | | | | |
| | Debris Buildup | | | | X | | | |
| | Exposed Aggregate | | | | X | | | |
| | Leaks through Walls | | | | | | | |
| | Structural Defects | | | | X | | | |
| | Moss | | | | X | | | |

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| 2. DISTRESS INDICATORS | X | Cracking or breakage |
|------------------------|---|-------------------------------------|
| | X | Rot and decay |
| | X | Surface deposits |
| | X | Termite or Pest Infestation (Borer) |

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS
(Tripping, fall, fall through, slippery, impingement, and falling debris)

| 3A - Overall Apparent Alignment of Structure | | | | | | | |
|-----------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|---|-----------|--|-------------|
| | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| 3B - Surface Condition | | | | | | | |
| General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | <u>Poor</u> | X | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| Cracking | | | | X | | | |
| Loss of Material | | | | X | | | |
| Missing or broken members | | | | X | | | |
| Damage or distress | | | | X | | | |
| Collapse, partial collapse or structure off | | | | | | | |
| Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| Ground or slope movement present | | | | X | | | |
| Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | X | | | |
| Fasteners: Corrosion | | | | X | | | |
| Soft timber and decay | | | | X | | | |
| Abrasion | | | | X | | | |
| Previous Repair | | | | X | | | |
| Surface Coatings, Protective Systems | | | | X | | | |
| Debris Buildup | | | | X | | | |
| Structural Defects | | | | X | | | |
| Moss | | | | X | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST06
Overhead Power Line Crossing
Parcel No. *Unknown*

WUS#: 50

Facility Location: River Mile 4.3
Direction (side) River Crossing
STA 350+40 to STA 438+30

Asset Type: Overhead Power Line

Use: Power Transmission

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

- The structure is an overhead power transmission line crossing the river consisting of one tower offshore of the east and one offshore of the west banks of the river. The transmission line is tied to the fenced-in Duwamish Electrical Substation west of the west tower (Photos 1 to 6).
- The west tower is supported by concrete pier (Photos 5 and 6). The east tower foundation is not visible and cannot be determined (Photo 7).
- Bulkhead along the west bank consisting of concrete and timber retaining walls along the upper slope and rip rap along the lower and toe of the slope. The embankment consists of vegetation and vegetated rip rap (Photos 1 to 6).
- The embankment around the east tower consists of vegetated rip rap (Photo 7).

Accessibility:

- The west tower and embankment are accessible from the land side.
- The east tower appears to be accessible from the land side, however the east embankment appears steep and may only be accessible from the water side.

Potential Hazards:

- Overhead structure consists of high power transmission lines. The overhead clearance is unknown.
- The east tower embankment appears to be steep and heavily vegetated.

VICINITY MAP



PHOTOGRAPHS

Timber Bulkhead

Concrete Bulkhead

Timber Bulkhead



Photo ST06-01: West Shoreline Bulkhead South End

Timber Bulkhead



Photo ST06-02: West Shoreline Bulkhead

CMP Outfall

PHOTOGRAPHS



Photo ST06-03: West Shoreline Bulkhead



Photo ST06-04: West Shoreline North End

PHOTOGRAPHS



Photo ST06-05: West Tower (Looking West)

West Tower
Foundation



West Tower
Foundation

Photo ST06-06: West Shoreline

PHOTOGRAPHS



Photo ST06-07: East Shoreline

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST07
Name
Parcel No. _____

WUS#: 66

Facility Location: River Mile 4.5
Direction (side) East
STA 359+00 to STA 374+00

Asset Type: Timber Groins and Wharf

Use: Wharf, Groin

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete apron supported on concrete piers (Photo 1).
- Two wharfs consisting of concrete aprons and braced timber pile supports (Photos 2 to 4).
- Several rows of closely spaced timber pile groins and bulkhead (Photos 5 to 10).
- All of the pile groins are covered by moss and the tops appear to be rotted. A close inspection for soundness was not conducted.

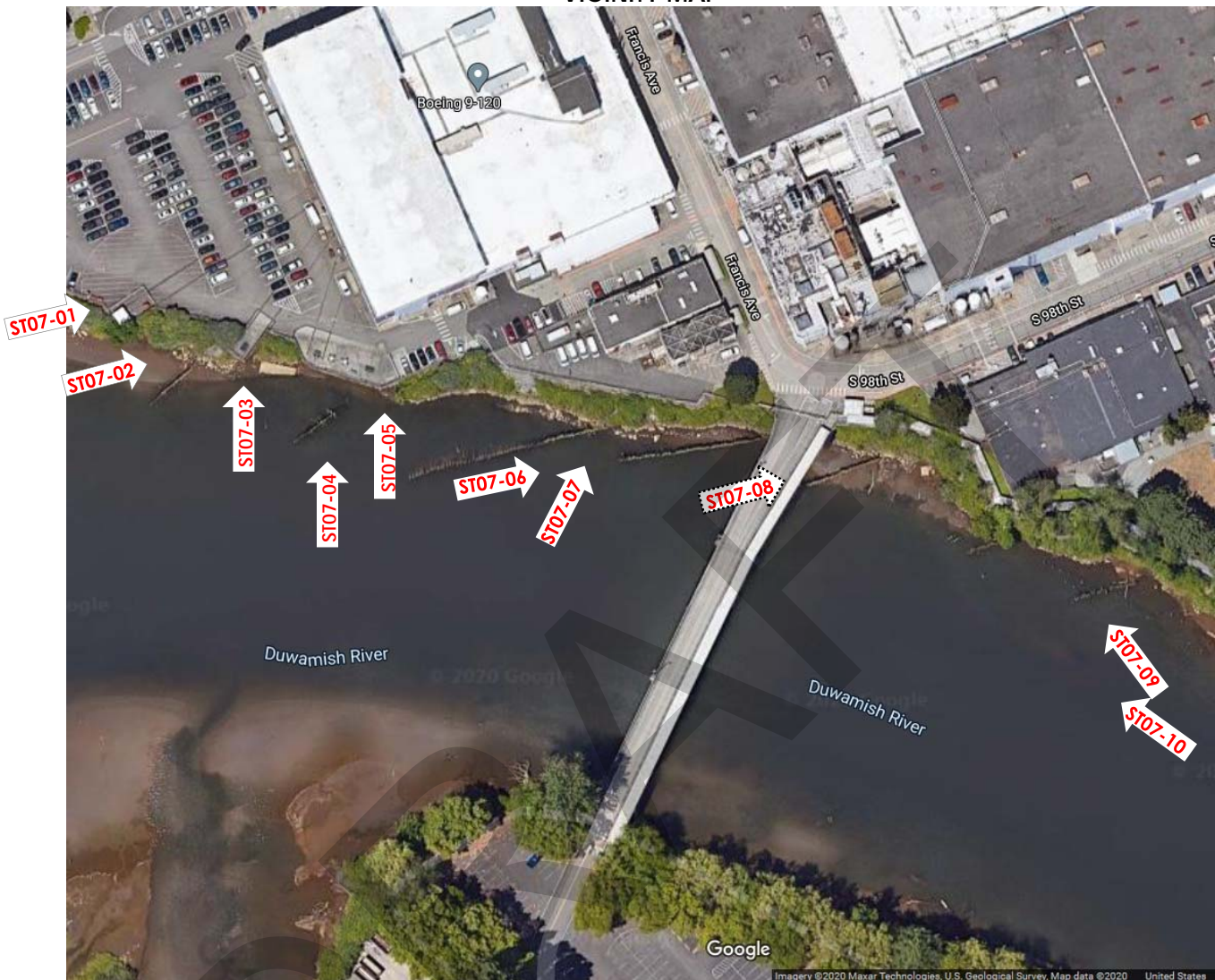
Accessibility:

- The pile groins are closely spaced; however, areas between the rows of pile groins are accessible.
- Limited accessibility to areas under the wharf.

Potential Hazards:

- Condition of the piles above and below mudline could not be determined.
- Condition of the pile and pier supports under the wharf could not be determined.

VICINITY MAP



PHOTOGRAPHS



Photo ST07-01: North (Down Stream Looking East) –most Structure



Photo ST07-02: Wharfs (Looking East)

PHOTOGRAPHS



Photo ST07-03: Smaller Wharf



Photo ST07-04: Larger Wharf

PHOTOGRAPHS



Timber
Pile

Photo ST07-05: Timber Bulkhead



Groins

S 98th St
Bridge

Photo ST07-06: Groins North of Bridge (Looking Southeast)

PHOTOGRAPHS



Photo ST07-07: Groins and Embankments North of Bridge



Photo ST07-08: Groins and Embankment South of Bridge

PHOTOGRAPHS

Groin
Rows



Photo ST07-09: Groins and Embankment South of Bridge

S 98th St
Bridge



Photo ST07-10: Groins and Embankment South of Bridge (Looking Northeast)

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Drainage | | 1C – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|---------------|---------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Flashing | | Expansive soil |
| | | Freezing and thawing | | Joint sealants | | Compressive soil (settlement) |
| | X | Wetting and drying | | Weepholes | | Evidence of pumping |
| | | Drying under dry atmosphere | | Contour | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Elevation of drains | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, cavitation, impact | | | | |
| | | Heat from adjacent sources | | | | |

| 2. DISTRESS INDICATORS | | Cracking or Breakage |
|------------------------|--|---------------------------------|
| | | Staining |
| | | Surface deposits and exudations |
| | | Leaking |

| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|--|-------------------------------------------------------------------------------------|--|-------------|
| | | Settlement | | Deflection/Leaning | | Expansion |
| | | | | | | Contraction |
| | 3B – Surface Condition | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | |
| | | <u>Fair</u> | | Average wear: not new but no issues to report. Between 5% - 20% cross section. | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | |
| | Formed and finished surfaces – slippery, uneven, or misaligned | | | | | |
| | Cracking | | | | | |
| | Scaling | | | | | |
| | Spalls, pop outs, and delamination | | | | | |
| | Stains, Efflorescence | | | | | |
| | Exposed Reinforcement: Corrosion | | | | | |
| | Damage or distress | | | | | |
| | Missing or broken members | | | | | |
| | Collapse, partial collapse or structure off foundation | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | |
| | Ground or slope movement present | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing | | | | | |
| | Curling and warping | | | | | |
| | Erosion | | | | | |
| | Previous Patching or Other Repair: | | | | | |
| | Surface Coatings, Protective Systems, Linings, | | | | | |
| | Penetrating Sealers | | | | | |
| | Signs of Past Overflow on Rungs and Walls | | | | | |
| | Debris Buildup | | | | | |
| | Exposed Aggregate | | | | | |
| | Leaks through Walls | | | | | |
| | Structural Defects | | | | | |
| | Moss | | | | | |

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | X | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| 2. DISTRESS INDICATORS | X | Cracking or breakage |
|------------------------|---|-------------------------------------|
| | X | Rot and decay |
| | X | Surface deposits |
| | X | Termite or Pest Infestation (Borer) |

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS
(Tripping, fall, fall through, slippery, impingement, and falling debris)

| 3A - Overall Apparent Alignment of Structure | | | | | | | |
|-----------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|---|-----------|--|-------------|
| | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| 3B - Surface Condition | | | | | | | |
| General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | <u>Poor</u> | X | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| Finished surfaces - slippery, uneven, or misaligned | | | | | | | |
| Cracking | | | | X | | | |
| Loss of Material | | | | X | | | |
| Missing or broken members | | | | X | | | |
| Damage or distress | | | | X | | | |
| Collapse, partial collapse or structure off | | | | | | | |
| Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| Ground or slope movement present | | | | X | | | |
| Unstable supports - gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| Fasteners: Corrosion | | | | X | | | |
| Soft timber and decay | | | | X | | | |
| Abrasion | | | | X | | | |
| Previous Repair | | | | X | | | |
| Surface Coatings, Protective Systems | | | | | | | |
| Debris Buildup | | | | X | | | |
| Structural Defects | | | | | | | |
| Moss | | | | X | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST08
S 98th Street (Boeing) Bridge
Parcel No. _____

WUS#: 66

Facility Location: River Mile 4.8

Direction (side) Both

STA 379+00 to STA 391+00

Asset Type: Concrete Bridge

Use: Vehicular Bridge

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Three (3)-span concrete girder bridge (Photo 1).
- East and west concrete abutments protected with riprap (Photos 2 and 3).
- Two (2) bents in the navigational channel each consisting of seven (7) steel piers and concrete cap beam (Photos 4 and 5).
- The concrete surface of the abutments and girders appears to be in good condition (Photos 2 to 4).
- The surface of the steel piers exhibits scattered rust and corrosion (Photos 4 and 5).

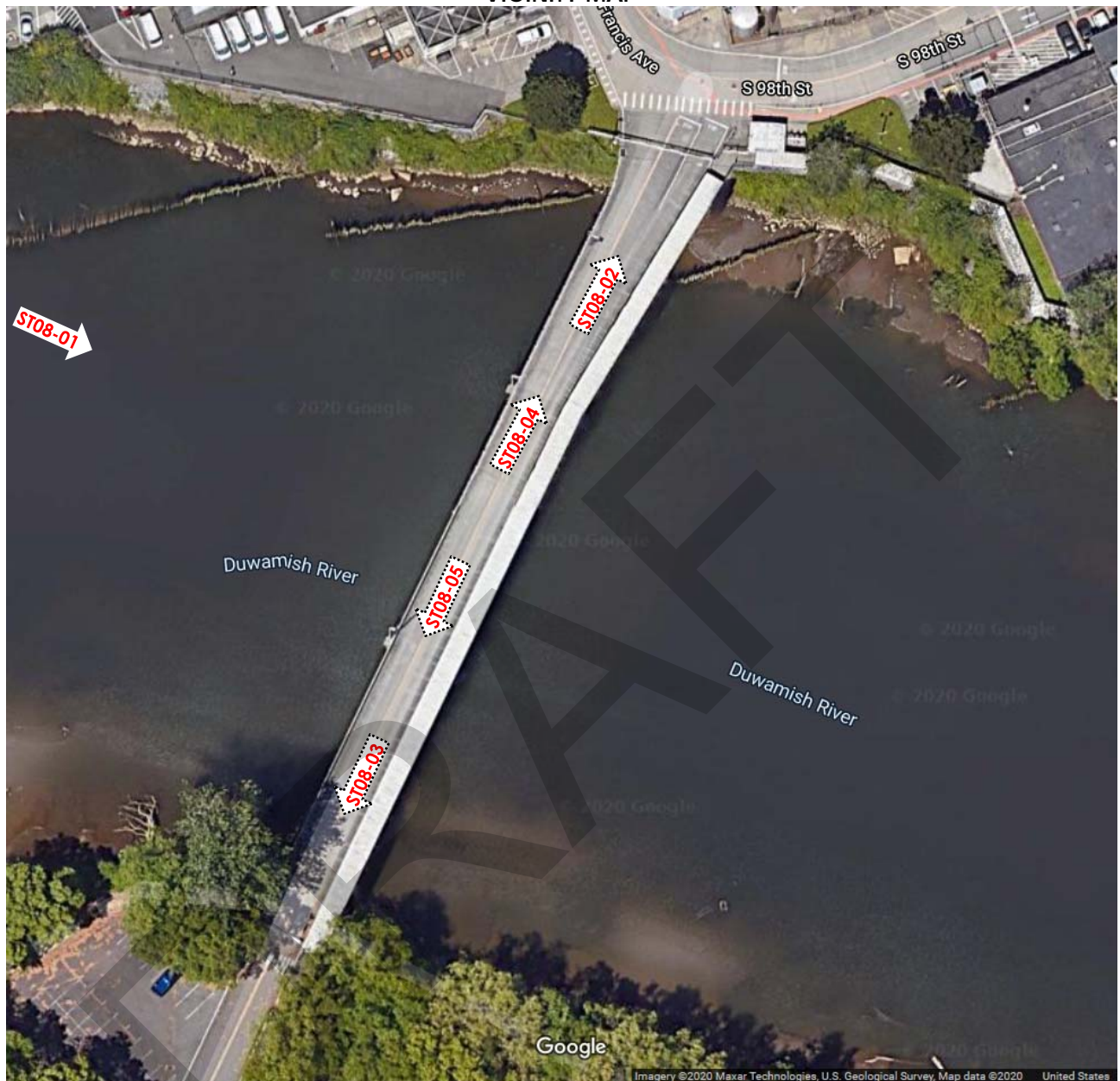
Accessibility:

- Accessibility may be limited in areas outside the navigable channel (between the piers and abutments).

Potential Hazards:

- Vessel clearance outside the navigable channel.

VICINITY MAP



PHOTOGRAPHS



Photo ST08-01: Bridge (Looking South)

Riprap



Photo ST08-02: East Abutment

PHOTOGRAPHS

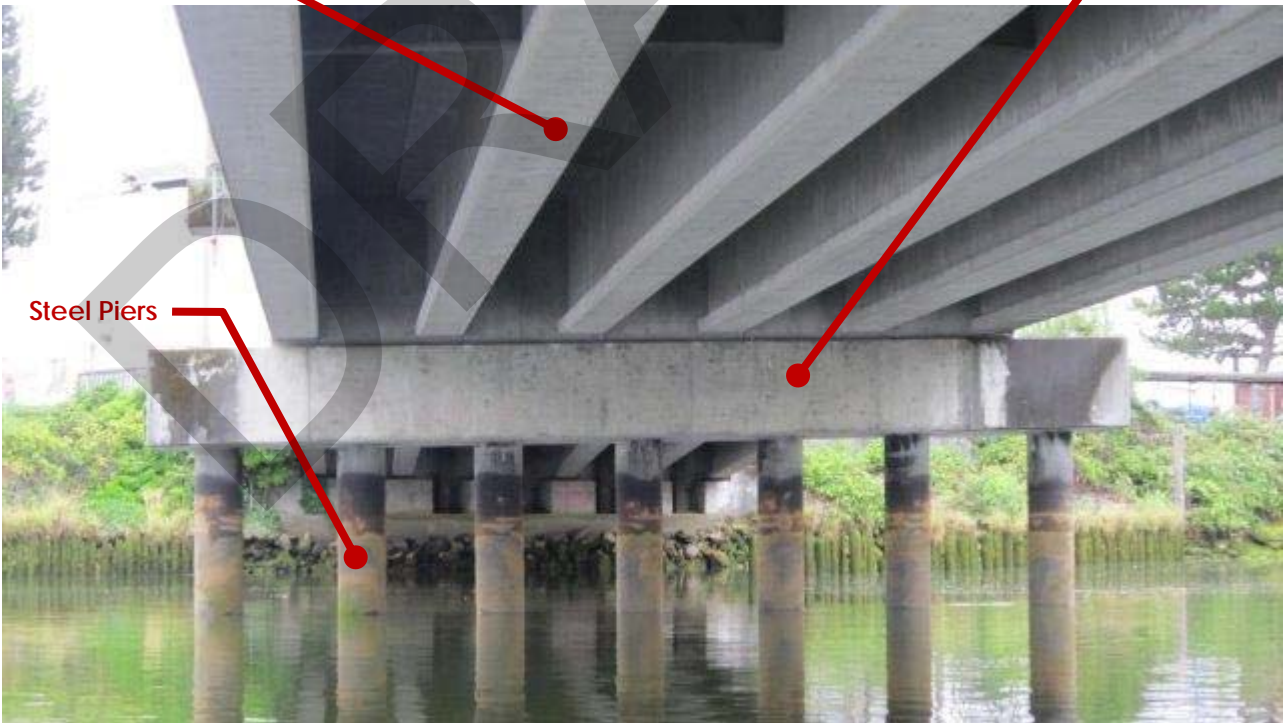
Riprap



Photo ST08-03: West Abutment

Concrete Girders

Cap Beam



Steel Piers

Photo ST08-04: East Bent (Looking East)

Steel Pier

PHOTOGRAPHS



Photo ST08-05: West Bent (Looking West)

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Drainage | | 1C – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|---------------|---------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Flashing | | Expansive soil |
| | | Freezing and thawing | | Joint sealants | | Compressive soil (settlement) |
| | X | Wetting and drying | | Weepholes | | Evidence of pumping |
| | | Drying under dry atmosphere | | Contour | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Elevation of drains | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, cavitation, impact | | | | |
| | | Heat from adjacent sources | | | | |

| 2. DISTRESS INDICATORS | X | Cracking or Breakage |
|------------------------|---|---------------------------------|
| | X | Staining |
| | X | Surface deposits and exudations |
| | | Leaking |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | X | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Formed and finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | | | | | | |
| | Scaling | | | | | | | |
| | Spalls, pop outs, and delamination | | | | | | | |
| | Stains, Efflorescence | | | | | | | |
| | Exposed Reinforcement: Corrosion | | | | | | | |
| | Damage or distress | | | | | | | |
| | Missing or broken members | | | | | | | |
| | Collapse, partial collapse or structure off foundation | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing | | | | | | | |
| | Curling and warping | | | | | | | |
| | Erosion | | | | | | | |
| | Previous Patching or Other Repair: | | | | | | | |
| | Surface Coatings, Protective Systems, Linings, | | | | | | | |
| | Penetrating Sealers | | | | | | | |
| | Signs of Past Overflow on Rungs and Walls | | | | | | | |
| | Debris Buildup | | | | | | | |
| | Exposed Aggregate | | | | | | | |
| | Leaks through Walls | | | | | | | |
| | Structural Defects | | | | | | | |
| | Moss | | | | | | | |

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|-----------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, impact | | |
| | | Heat from adjacent sources | | |

| 2. DISTRESS INDICATORS | | Member cracking or breakage |
|------------------------|--|-----------------------------|
| | | Staining, corrosion |
| | | Surface deposits |
| | | Weld cracking or breakage |

| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|
| | | Settlement | | Deflection/Leaning |
| | 3B – Surface Condition | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. |
| | | <u>Good</u> | X | Good condition: no reported issues or concerns. Less than 5% loss of cross section. |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. |
| | Finished surfaces – slippery, uneven, or misaligned | | | |
| | Cracking | | | |
| | Rust and scale | | | |
| | Loss of Material | | | |
| | Missing or broken members | | | |
| | Damage or distress | | | |
| | Collapse, partial collapse or structure off foundation | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | |
| | Ground or slope movement present | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing | | | |
| | Stains | | | |
| | Corrosion | | | |
| | Abrasion | | | |
| | Previous Repair | | | |
| | Surface Coatings | | | |
| | Debris Buildup | | | |
| | Structural Defects | | | |
| | Moss | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST09
Miscellaneous Bulkhead – 1
Parcel No. _____

WUS#: None

Facility Location: River Mile 4.9

Direction (side) East

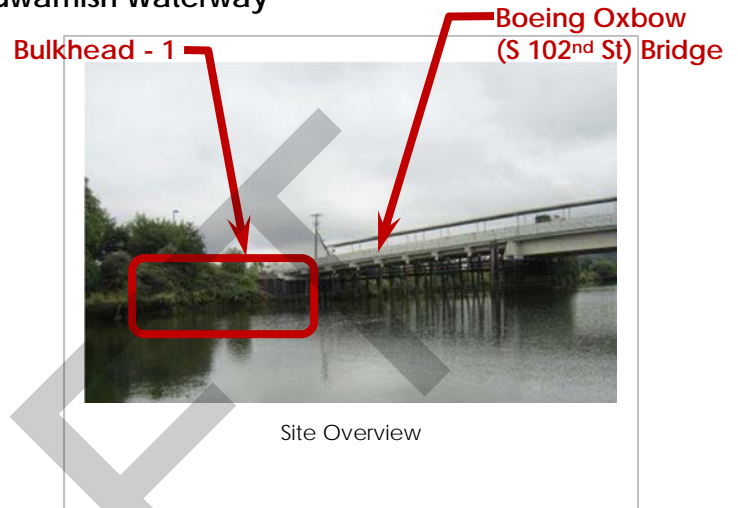
STA 378+50 to STA 380+00

Asset Type: Bulkhead

Use: Soil Retention, Shoreline Protection

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is just north of the Boeing Oxbow (S 102nd St) Bridge and consists of:

- Timber soldier pile and concrete panel lagging (Photo 1 and 2).
- Missing timber soldier piles in front of the concrete lagging. It appears that the south end of the wall is tied back or connected to a steel sheet wall. Large cracks throughout the concrete panel. Wall is in poor condition.
- Derelict timber barge or boat hull (Photos 1 and 3). The hull appears to be intact. Condition of the timber is unknown.
- Timber soldier pile and timber lagging (Photo 3).
- Missing, broken, or unfound timber piles and lagging.

Accessibility:

- No obstruction observed.

Potential Hazards:

- Stability of structure unknown.

PHOTOGRAPHS

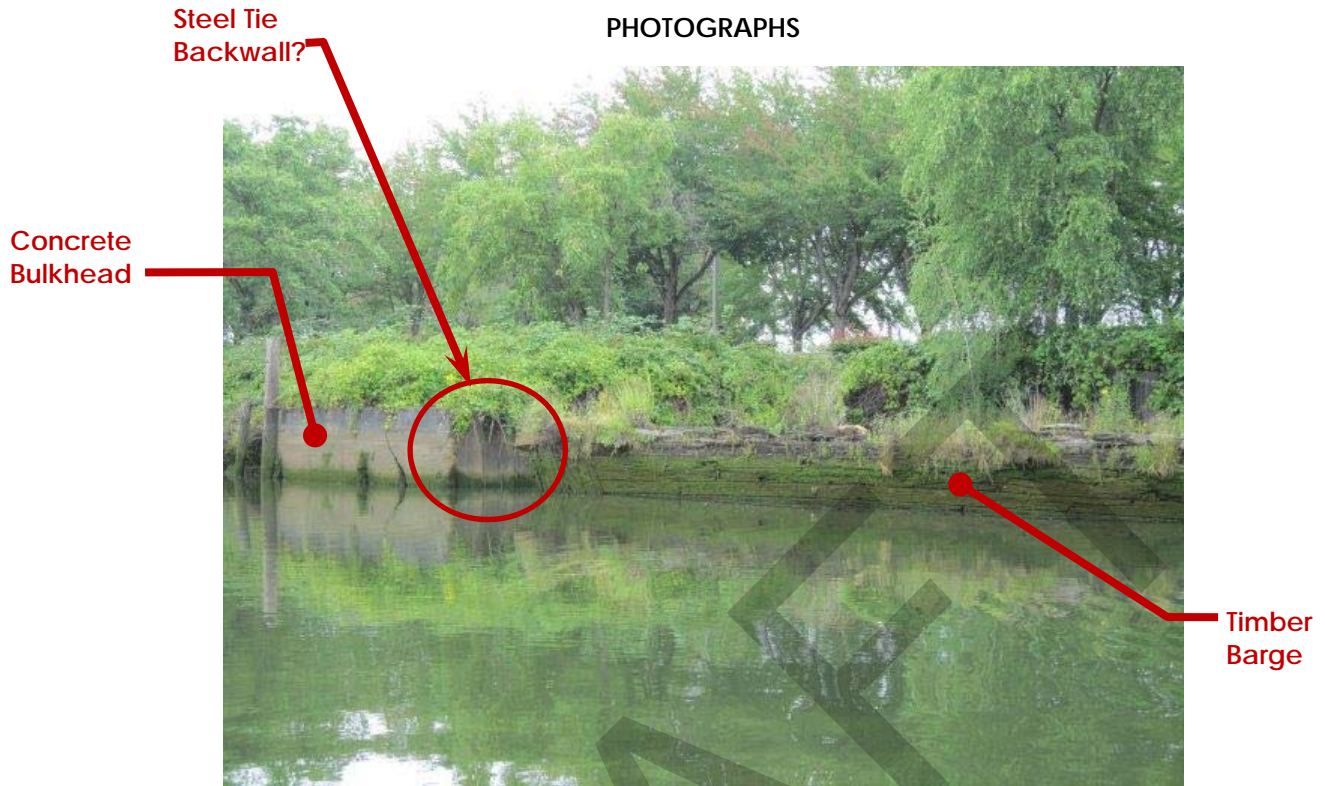


Photo ST09-01: Bulkhead (Looking East)

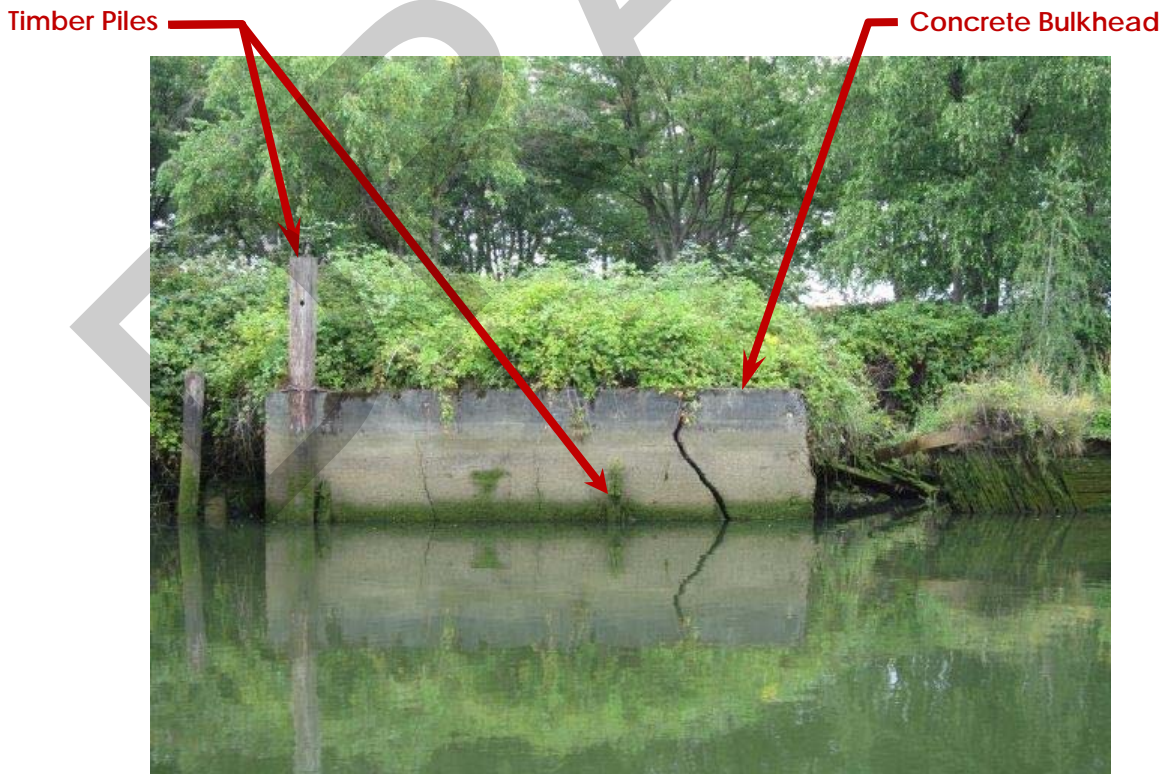


Photo ST09-02: Enlarged Concrete Bulkhead

PHOTOGRAPHS



Photo ST09-03: Timber Barge and Bulkhead (Looking East)

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Drainage | | 1C – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|---------------|---------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Flashing | | Expansive soil |
| | | Freezing and thawing | | Joint sealants | | Compressive soil (settlement) |
| | X | Wetting and drying | | Weepholes | | Evidence of pumping |
| | | Drying under dry atmosphere | | Contour | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Elevation of drains | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, cavitation, impact | | | | |
| | | Heat from adjacent sources | | | | |

| 2. DISTRESS INDICATORS | X | Cracking or Breakage |
|------------------------|---|---------------------------------|
| | | Staining |
| | X | Surface deposits and exudations |
| | | Leaking |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | X | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Formed and finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | | X | | | | |
| | Scaling | | | | | | | |
| | Spalls, pop outs, and delamination | | | | | | | |
| | Stains, Efflorescence | | | | | | | |
| | Exposed Reinforcement: Corrosion | | | | | | | |
| | Damage or distress | | | X | | | | |
| | Missing or broken members | | | X | | | | |
| | Collapse, partial collapse or structure off foundation | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing | | | | | | | |
| | Curling and warping | | | | | | | |
| | Erosion | | | | | | | |
| | Previous Patching or Other Repair: | | | | | | | |
| | Surface Coatings, Protective Systems, Linings, | | | | | | | |
| | Penetrating Sealers | | | | | | | |
| | Signs of Past Overflow on Rungs and Walls | | | | | | | |
| | Debris Buildup | | | | | | | |
| | Exposed Aggregate | | | | | | | |
| | Leaks through Walls | | | X | | | | |
| | Structural Defects | | | | | | | |
| | Moss | | | | | | | |

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | X | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| 2. DISTRESS INDICATORS | X | Cracking or breakage |
|------------------------|---|-------------------------------------|
| | X | Rot and decay |
| | X | Surface deposits |
| | | Termite or Pest Infestation (Borer) |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | X | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | | | | X | | |
| | Loss of Material | | | | | X | | |
| | Missing or broken members | | | | | X | | |
| | Damage or distress | | | | | X | | |
| | Collapse, partial collapse or structure off | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| | Fasteners: Corrosion | | | | | X | | |
| | Soft timber and decay | | | | | | | |
| | Abrasion | | | | | | | |
| | Previous Repair | | | | | | | |
| | Surface Coatings, Protective Systems | | | | | | | |
| | Debris Buildup | | | | | | | |
| | Structural Defects | | | | | | | |
| | Moss | | | | | X | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST10
Miscellaneous Piles-1
Parcel No. _____

WUS#: None

Facility Location: River Mile 4.7

Direction (side) West

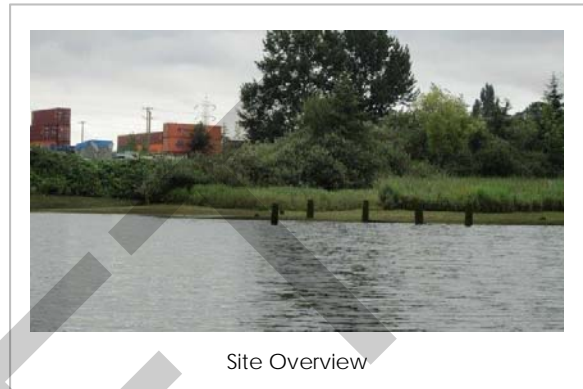
STA 411+00

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photo 1).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS



Photo ST10-01: Piles

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| | | | | |
|----------------------------|----------------------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | Heat from adjacent sources | | | |

| | | |
|------------------------|---|-------------------------------------|
| 2. DISTRESS INDICATORS | X | Cracking or breakage |
| | X | Rot and decay |
| | X | Surface deposits |
| | | Termite or Pest Infestation (Borer) |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | X | | | | | |
| | Loss of Material | | X | | | | | |
| | Missing or broken members | | X | | | | | |
| | Damage or distress | | X | | | | | |
| | Collapse, partial collapse or structure off | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| | Fasteners: Corrosion | | | | | | | |
| | Soft timber and decay | | | | | | | |
| | Abrasion | | | | | | | |
| Previous Repair | | | | | | | | |
| Surface Coatings, Protective Systems | | | | | | | | |
| Debris Buildup | | | | | | | | |
| Structural Defects | | | | | | | | |
| Moss | | | | | | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST11
Miscellaneous Piles-2
Parcel No. _____

WUS#: None

Facility Location: River Mile 4.3

Direction (side) West

STA 440+00 to STA 443+40

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photos 1 and 2).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS



Photo ST11-01: South Pile Field



Photo ST11-02: North Pile Field

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | | | | | |
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil | | | | |
| | | Freezing and thawing | | Compressive soil (settlement) | | | | |
| | X | Wetting and drying | | Evidence of pumping | | | | |
| | | Drying under dry atmosphere | | Scour | | | | |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment | | | | |
| | X | Abrasion, erosion, impact | | | | | | |
| | | Heat from adjacent sources | | | | | | |
| 2. DISTRESS INDICATORS | X | Cracking or breakage | | | | | | |
| | X | Rot and decay | | | | | | |
| | X | Surface deposits | | | | | | |
| | | Termite or Pest Infestation (Borer) | | | | | | |
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | X | | | | | |
| | Loss of Material | | X | | | | | |
| | Missing or broken members | | X | | | | | |
| | Damage or distress | | X | | | | | |
| | Collapse, partial collapse or structure off | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| | Fasteners: Corrosion | | | | | | | |
| | Soft timber and decay | | | | | | | |
| | Abrasion | | | | | | | |
| | Previous Repair | | | | | | | |
| | Surface Coatings, Protective Systems | | | | | | | |
| Debris Buildup | | | | | | | | |
| Structural Defects | | | | | | | | |
| Moss | | | | | | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST12
Delta Marine Industries
Parcel No. 5624200005

WUS#: 43

Facility Location: River Mile 4.1
Direction (side) West
STA 446+00 to STA 454+00

Asset Type: Wharf – Concrete Finger Piers

Use: Vessel manufacturing, mooring vessels for outfitting and repairs

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. Some physical measurements were taken at this site.

The structure consists of:

- a) Two (2) finger piers to the south that each comprise of:
 - Two (2) rows of seven (7) bents of 30" diameter steel pipe piles (one now vertical and the other battered). (Photos 1 and 2)
 - Concrete pile cap – Approximately 24" deep x 48" wide, 22-ft on center. (Photos 3 and 4)
 - Precast concrete haunched pier decks (two wide per bent). (Photo 5)
- b) A floating dock supported with five (5) steel pipe guide piles *[verify material for north most guide pile]*, a floating walkway to the west support with four (4) timber guide piles, and an aluminum gangway that leads to the apron/wharf. (Photos 6 to 8)
- c) Steel sheet pile bulkhead with concrete pile cap along the south return and, along the wharf, up to the north finger pier. (Photos 1, 2 and 9)
- d) Steel H-pile bulkhead with precast concrete panel lagging and steel cap from the north pier, along the wharf, to the north end. H-Piles are about 8-ft on center. (Photos 8 to 14)
- e) Steel sheet pile bulkhead along the north return. (Photo 14)
- f) *[Verify who owns breakwater/debris deflector at north end adjacent to the Duwamish Yacht Club.]* (Photo 15)
- g) A three (3) steel pipe guide pipe and supporting debris deflection *[steel verify]* pipe float. Located up stream of the south finger pier. (Photo 16)

General

- The steel pipes are in good condition.
- Concrete pile cap and pier decks are in good condition.
- The surface of the floating dock guide piles and gangway were not inspected during the site visit.
- Coating loss and surface rust corrosion was observed on the bulkhead, the H-piles, and steel accessories. Generally in good condition.
- The surfaces of the concrete panel are in good condition except a few scattered cracks, minor spalls, and moss growth.
- The guide piles and debris deflector were not closely observed.

Accessibility:

- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- The finger piers appear to be accessible between the bents and outboard along the piers. Accessibility between the bents near the bulkhead may also depend on the river bed profile.
- The floating dock is accessible on all sides except when large vessels are moored at the float or at the wharf.
- Access along the east and north bulkhead is unrestricted except when the vessel is moored along the wharf.
- The debris deflection structure is accessible from both sides.

Potential Hazards:

- There are no overhead structures near the finger piers except the gangway.
- Along the east and north bulkhead, there are no overhead structures except the gangway and boat lift equipment.
- There are no overhead structures near the debris deflection structure.

VICINITY MAP



PHOTOGRAPHS

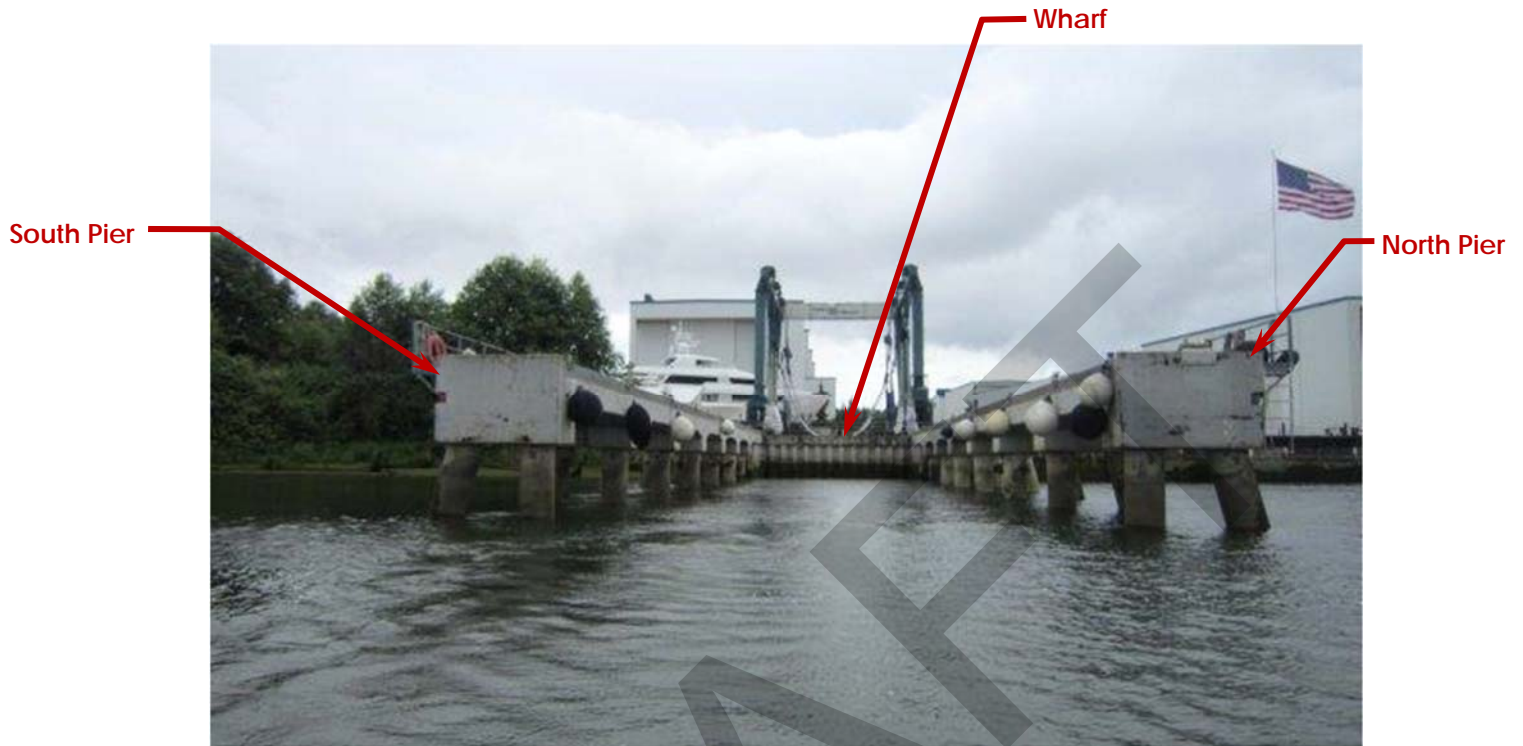


Photo ST12-01: Dock Fairway (Looking West)



Photo ST12-02: Finger Piers (Looking West)

PHOTOGRAPHS



Photo ST12-03: East End Piles and Caps of South Finger Pier



Photo ST12-04: South Pier Pile Rows (Looking West)

PHOTOGRAPHS



Photo ST12-05: Pile Cap and Pier Decks (Looking West)



Photo ST12-06: Floating Dock Access Way (Looking North)

PHOTOGRAPHS



Photo ST12-07: Floating Dock



Photo ST12-08: Bulkhead Among Wharf

PHOTOGRAPHS



Photo ST12-09: Bulkhead



Photo ST12-10: H-Pile Bulkhead (Looking North)

PHOTOGRAPHS



Photo ST12-11: Close Up of H-Pile Bulkhead



Photo ST12-12: North End Bulkhead and Return (Looking West)

PHOTOGRAPHS



Photo ST12-13: North End Close Up of the H-Pile Bulkhead



Photo ST12-014: Upstream North Bulkhead

PHOTOGRAPHS



Photo ST12-15: Breakwater



Photo ST12-016: Upstream Debris Deflector

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST13
Breakwater
Parcel No. _____

WUS#: 43

Facility Location: River Mile 4.1
Direction (side) West
STA 451+65 to STA 451+65

Asset Type: Timber Breakwater
Use: Shoreline Protection
Inspection Date: June 15, 2020
Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is located between Delta Marine Industries and the Duwamish Yacht Club. It consists of:

- Seven (7) sets of vertical and battered (toward the north) timber piles and horizontal timber slats (Photos 1 to 3).
- The piles appear to be in good condition, except several battered piles and slats are missing (Photos 1 and 2).
- Members are covered with moss within the tidal zone.
- Wood treatment is worn, but appears to be in good condition (Photo 3).

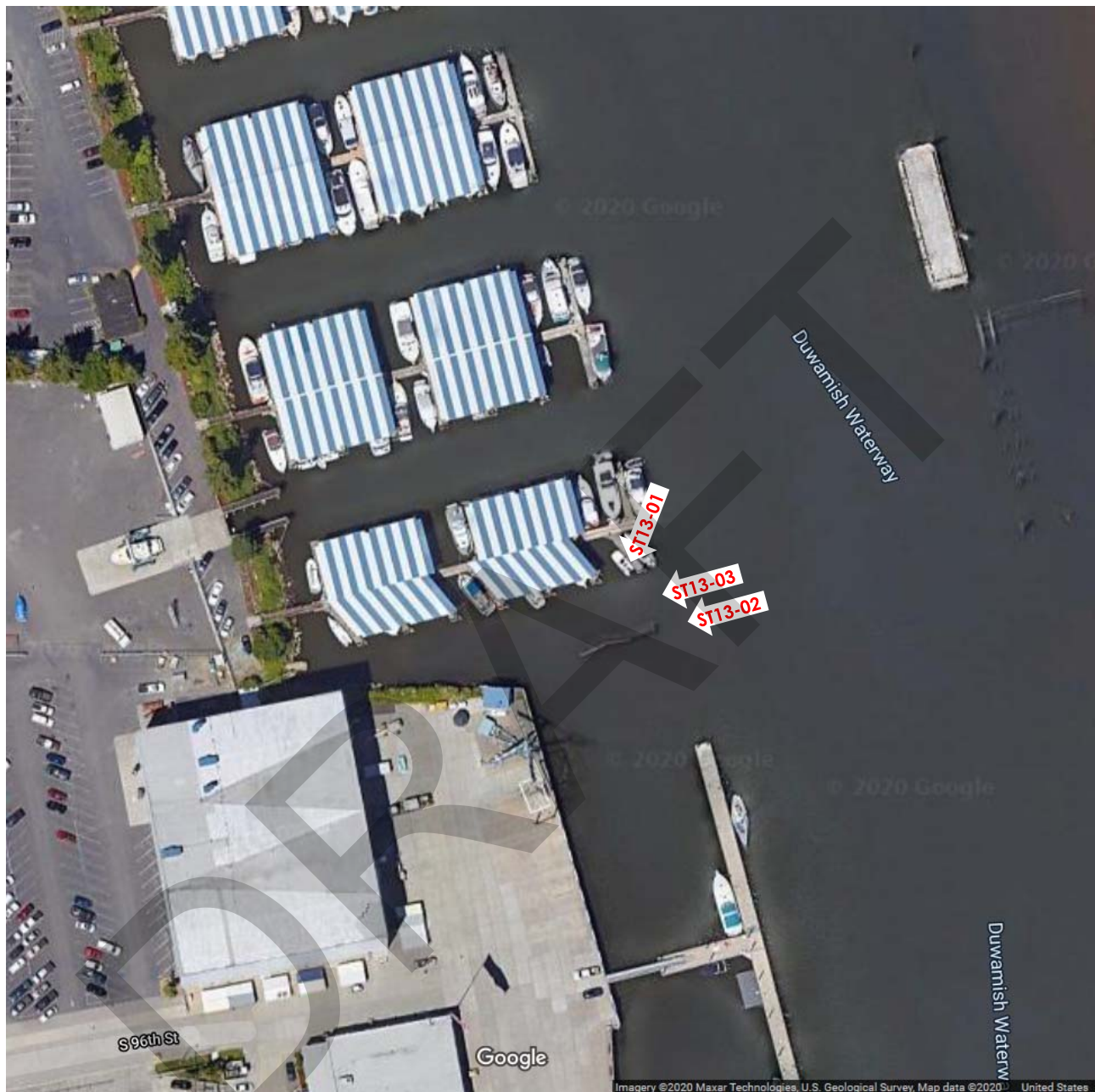
Accessibility:

- Access may be limited by the proximity of adjacent facilities: Delta Marine Industries and Duwamish Yacht Club.

Potential Hazards:

- The lateral stability of the piles is unknown.

VICINITY MAP



PHOTOGRAPHS



Photo ST13-01: Breakwater (Looking Northwest)



Photo ST13-02: Breakwater (Looking West)

PHOTOGRAPHS



Photo ST13-03: View of Battered Piles (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST14
Travel Lift Pier
Parcel No. _____

WUS#: 42

Facility Location: River Mile 4.1

Direction (side) West

STA 455+00 to STA 459+00

Asset Type: Pier

Use: Boat Lift

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is located on the west bank/shoreline nestled between the two southern docks of the Duwamish Yacht Club marina. It consists of:

- Traveling gantry crane (east to west).
- Two (2) crane runways (north and south ends) each supported on offshore piers.
- Each pier consists of six (6) bents of braced (north to south) heavy timber piles and framing. No bracing in the east-west direction was observed.
- Steel soldier pile and concrete panel lagging bulkhead.
- The piles and framing appear to be in good condition, except for moss growth within the tidal zone.
- Preservative treatment on the timber piles and framing is worn, but appears to be in good condition.
- It appears that several steel bracings were added to the braced bents to provide additional lateral stability.
- The condition of the concrete bulkhead could not be closely observed. Appears to be in good condition except for corrosion on the steel piles and moss growth in the tidal zone.

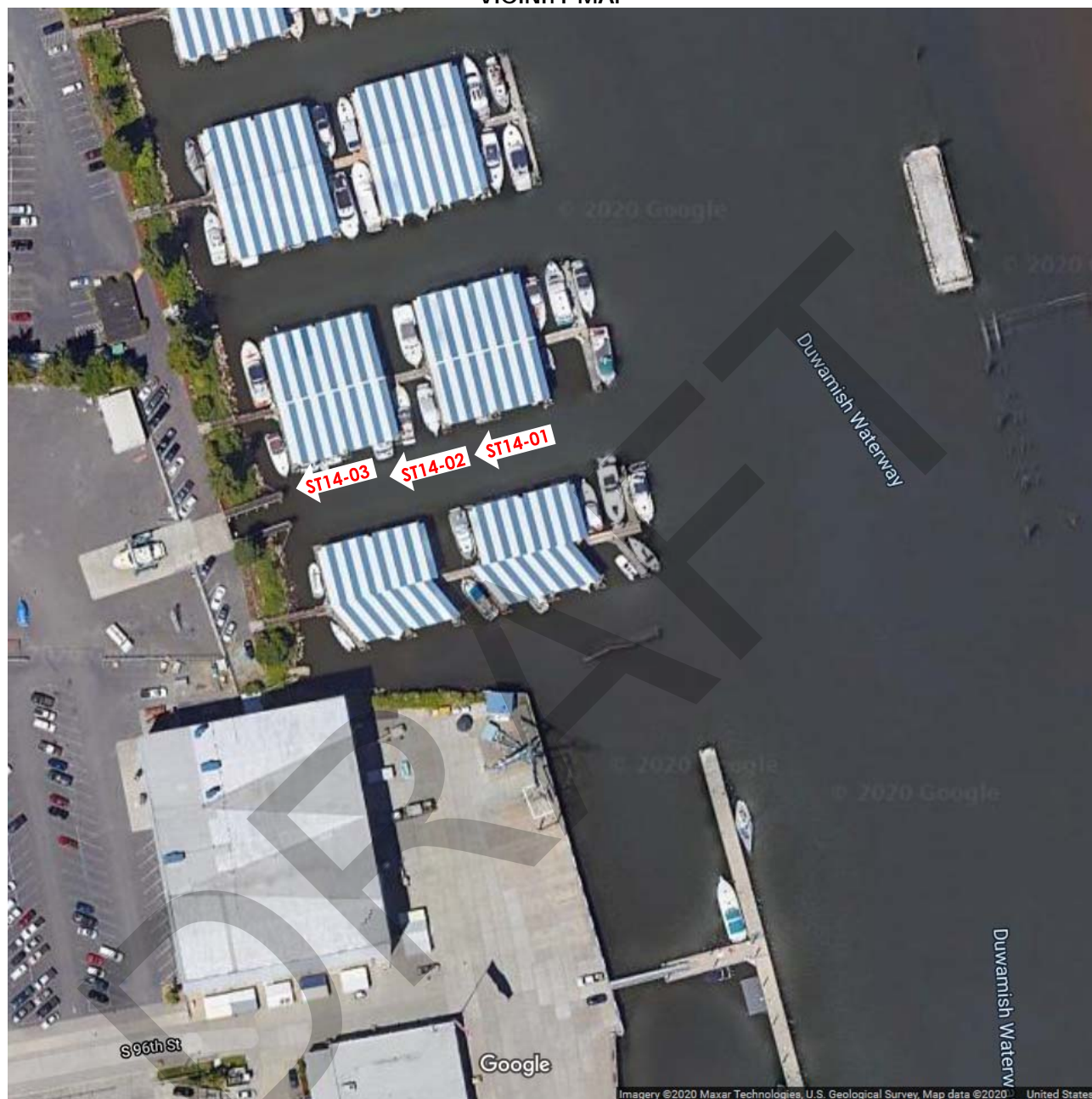
Accessibility:

- May be limited by (a) the adjacent docks along the approach and (b) the clearance around the boat lift pier.

Potential Hazards:

- The lateral stability of the pier is unknown.

VICINITY MAP



South Bents

PHOTOGRAPHS

North Bents

Gantry
Crane



Photo ST14-01: Boat Lift (Looking West)

Brace

Crane
Runway

Concrete
Bulkhead

Brace

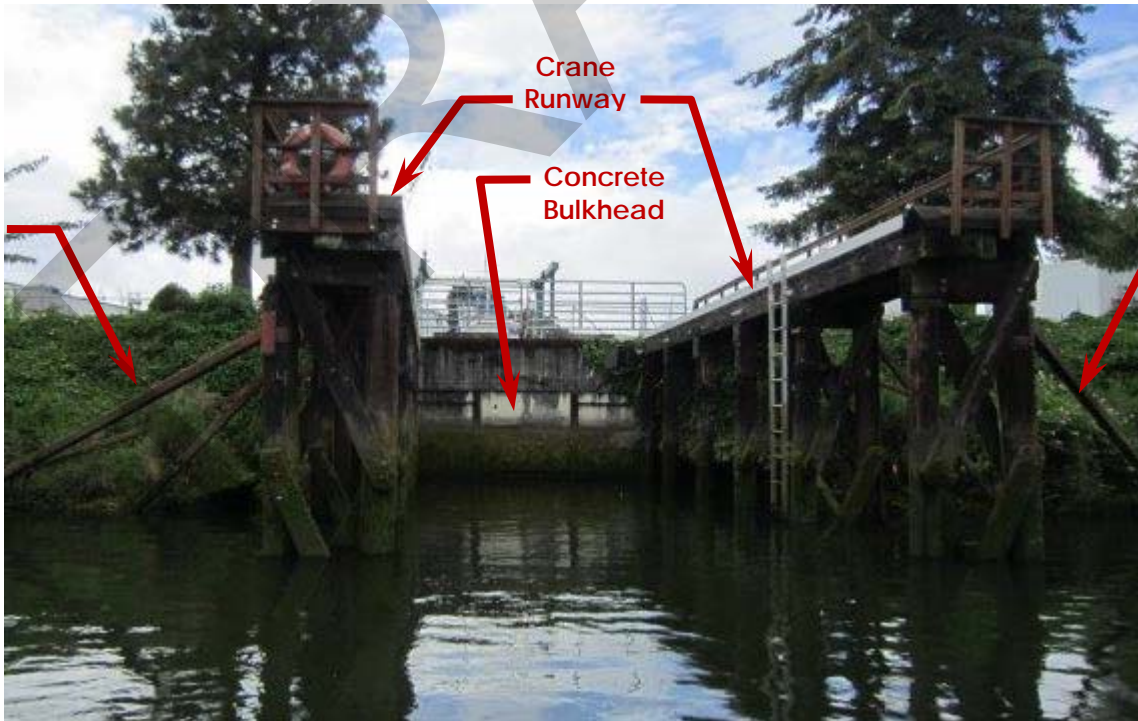


Photo ST14-02: Boat Lift Close Up

PHOTOGRAPHS



Photo ST14-03: North Bents

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/19/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST15
Duwamish Yacht Club
Parcel No. _____

WUS#: 42

Facility Location: River Mile 4.1
Direction (side) West
STA 454+00 to STA 462+00

Asset Type: Marina

Use: Moorage of Recreational Vessels

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Delta Marine Industries

Duwamish Yacht Club



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete bulkhead along the west bank (Photo 1). The bulkhead was not accessible, therefore not observed.
- Four (4) gangways leading to the floats (Photos 1 and 2). The gangway was not accessed, therefore not observed.
- Four (4) parallel covered docks each with connection primary floating walkways.
- Timber float guide piles.

Float

- The roof framing system consists of corrugated steel deck supported by either open web steel trusses or cold-formed steel beams (Photos 2 to 5).
- The columns consists of a pair of either tubular steel posts or wood posts which are supported on the floats. The upper half of the posts are braced in both directions (Photos 2 to 5).
- The walkway of the floats are framed with timber and concrete surfacing (Photo 5).
- The pile guide is wood framed (Photos 2 to 7).

Guide Piles

- The guide piles are timber piles with a steel sleeve filled to the upper section (Photos 2 to 4, 6 and 7).
- The guide piles are covered in moss around the tidal zone but appear to be in good condition (Photos 2 to 7).
- The preservative treatment on the piles are worn but appear to be in good condition (Photos 2 to 7).

Accessibility:

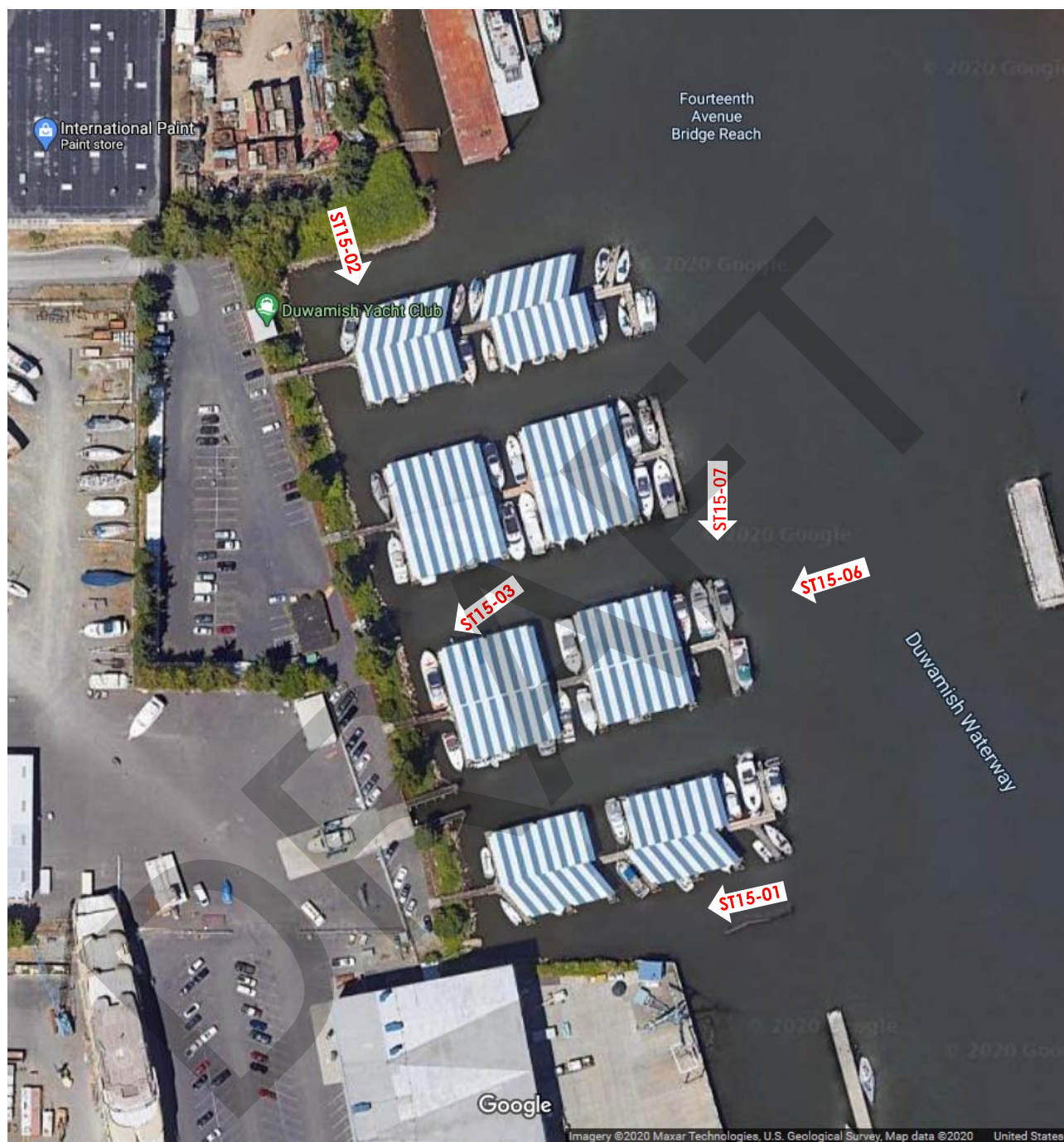
- Clearance width may be limiting on three sides of the marina.
- Overhead covers over the moorage/floats.
- Limited space between floats.

Potential Hazards:

- The lateral stability of the piles is unknown.

DRAFT

VICINITY MAP



*Photos 4 and 5 could not be specifically located as they are "typical" depictions

Delta Marine
Industries

Bulkhead

PHOTOGRAPHS

Gangway



Photo ST15-01: South-most Float (Looking West)

Roof Deck

Cold-formed Steel Beams

Gangway



Photo ST15-02: Floats (Looking South)

Float
Steel Columns

PHOTOGRAPHS

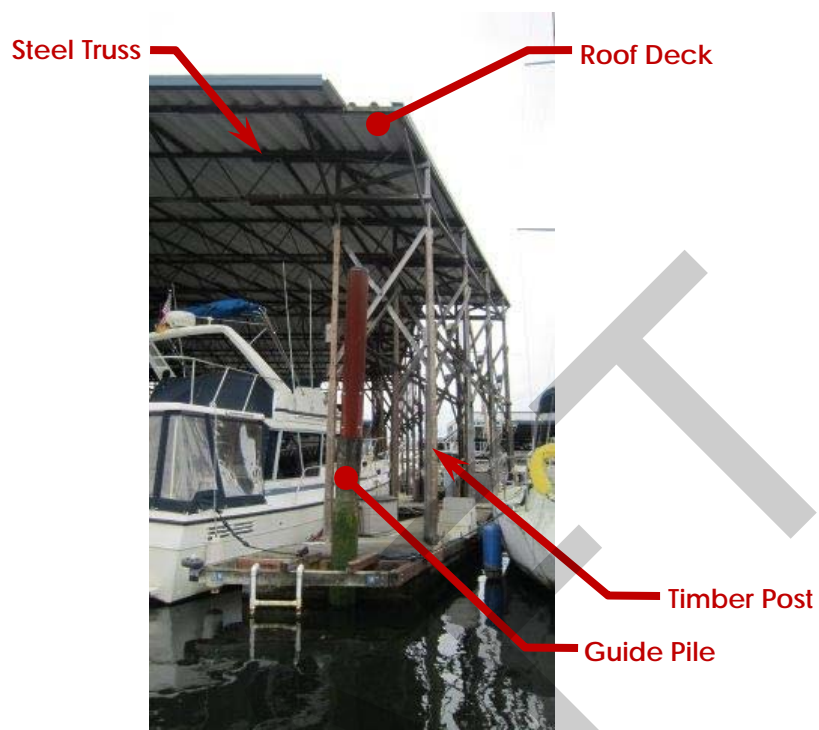


Photo ST15-03: Float Structure (Looking West)

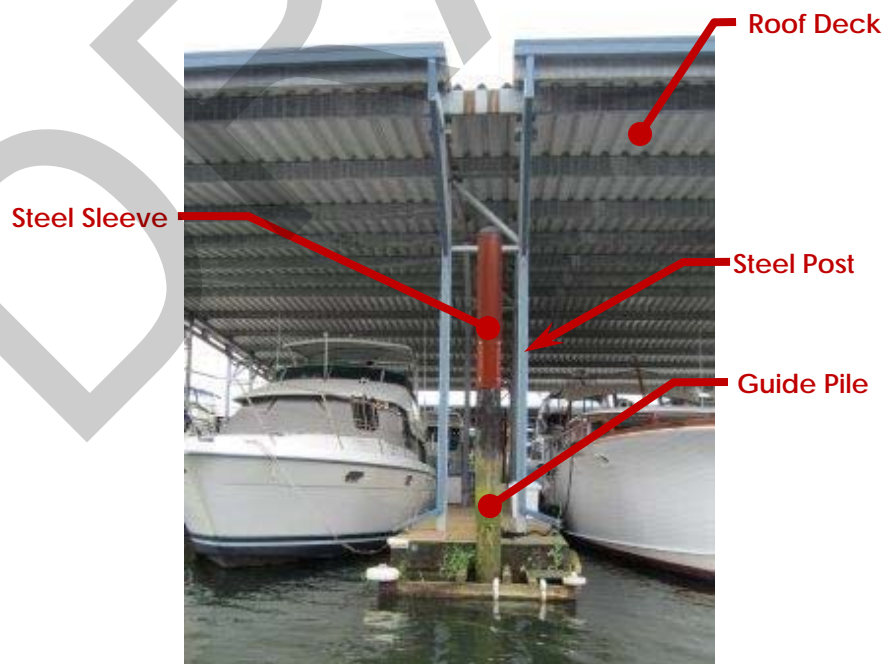


Photo ST15-04: Float Framing

PHOTOGRAPHS

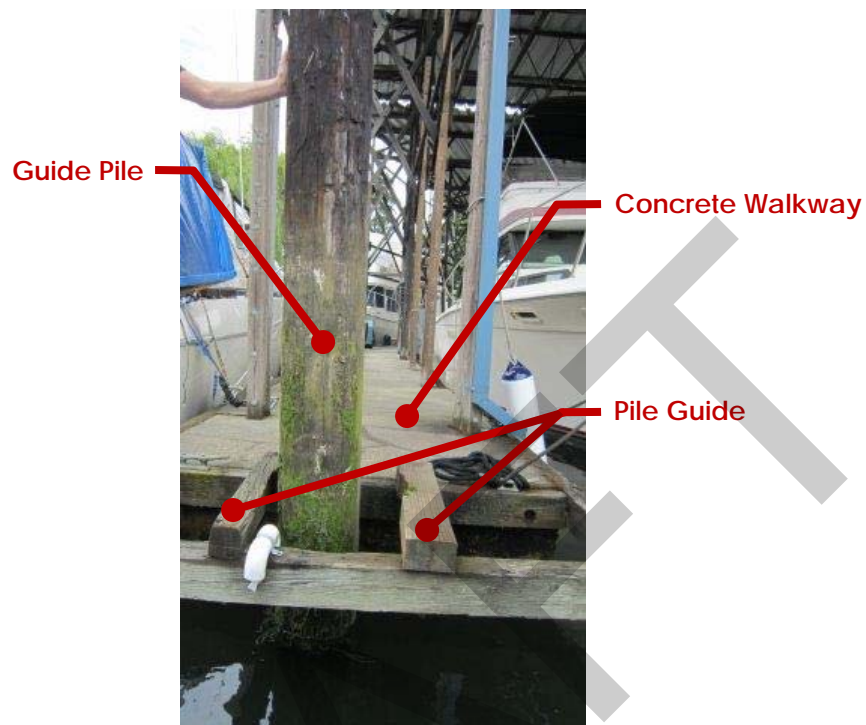


Photo ST15-05: Typical Float



Photo ST15-06: Outboard Float (Looking West)

PHOTOGRAPHS



Photo ST15-07: Outboard Float (Looking South)

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| | | | | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| | | |
|------------------------|---|-------------------------------------|
| 2. DISTRESS INDICATORS | | Cracking or breakage |
| | | Rot and decay |
| | X | Surface deposits |
| | | Termite or Pest Infestation (Borer) |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | X | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | | Finished surfaces – slippery, uneven, or misaligned | | X | | | | |
| | | Cracking | | | | | | |
| | | Loss of Material | | | | | | |
| | | Missing or broken members | | | | | | |
| | | Damage or distress | | | | | | |
| | | Collapse, partial collapse or structure off | | | | | | |
| | | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | |
| | | Ground or slope movement present | | | | | | |
| | | Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | |
| | | Fasteners: Corrosion | | | | | | |
| | | Soft timber and decay | | | | | | |
| | | Abrasion | | | | | | |
| | Previous Repair | | | | | | | |
| | Surface Coatings, Protective Systems | | X | | | | | |
| | Debris Buildup | | X | | | | | |
| | Structural Defects | | | | | | | |
| | Moss | | | | | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST16
Kelly Ryan (formerly McElroy George and Associates, Inc.)
Parcel No. 1600060

WUS#: 40

Facility Location: River Mile 4.0

Direction (side) West

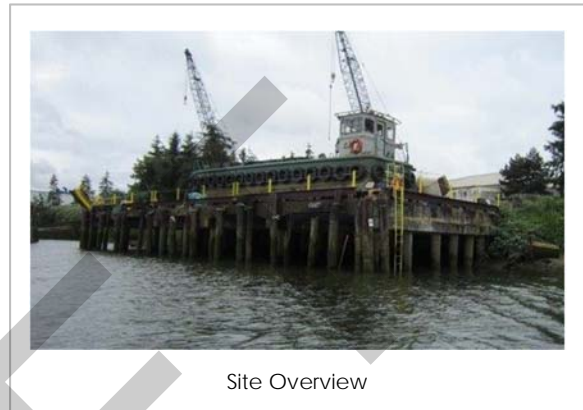
STA 464+00 to STA 466+10

Asset Type: Concrete Finger Piers

Use: Vessel Moorage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were done on the deck at this site.

Structure consists of four (4) connected finger piers (Photo 1). Each pier is approximately 20-ft wide x 36-ft long (in the east-west direction) and composed of:

- Five (5) rows of six (6) octagonal prestressed concrete pile bents. Piles on the 2nd and 5th bents are battered, the others are vertical.
- Five (5) rows of 34-in wide x 18-in deep concrete pile caps.
- Six (6) precast concrete haunched pier decks.
- Sets of two (2) timber fender piles at each pile cap and at mid-span of the pier decks.
- Steel sheet pile bulkhead.

Timber Fender Piles

- Majority of the fender piles are missing, broken, damaged, or in poor condition. Most pile straps are either missing or broken (Photos 2 to 5).

Concrete Piles

- The concrete piles appear to be in good condition except surface mortar erosion and moss growth in the wet/dry zone of the piles (Photos 6 and 7).
- There is a significant loss of concrete on the south face of the pile at Bent 4, Row 2. No exposed reinforcing or rust stains were observed (Photo 8).
- Approximately 12-in of the pile at Bent 2, Row 4 appears to be field built-up (Photo 9).

Concrete Caps

- The concrete surfaces of the pile caps appear to be in good condition. No cracks, spalls, or significant chips were observed (Photos 7 to 11).

Concrete Pier Decks

- Spall at the east face of both Pier 3 and Pier 4 decks. No exposed reinforcing or rust stains were observed (Photos 12 and 13).
- The concrete surface of the pier deck soffits appear to be in good condition (Photos 14 and 16).

Bulkhead

- A close observation of the steel sheet pile and concrete cap was not possible. There appears to be moss growth and rust in the wet/dry zone of the sheet pile (Photos 7, 10, 12, 14, and 15).

Accessibility:

- Accessibility to the structure depends on vessel size, height, draft, and tide level.
- The structure is accessible on the south and north sides. Access on the east side is obstructed by the fender piles.

Potential Hazards:

- Loose fender pile straps.
- Numerous piles are badly damaged, decayed, and/or unsound.

VICINITY MAP



PHOTOGRAPHS



Photo ST16-01: Pier Configuration



Photo ST16-02: Piers 2 to 4 (Looking Northwest)

PHOTOGRAPHS



Photo ST16-03: Piers 3 and 4



Photo ST16-04: Fender Pile

PHOTOGRAPHS



Photo ST16-05: Fender Pile



Battered Pile

Photo ST16-06: Concrete Piles

PHOTOGRAPHS



Photo ST16-07: Concrete Piles (Looking Southwest)



Photo ST16-08: Concrete Pile

PHOTOGRAPHS

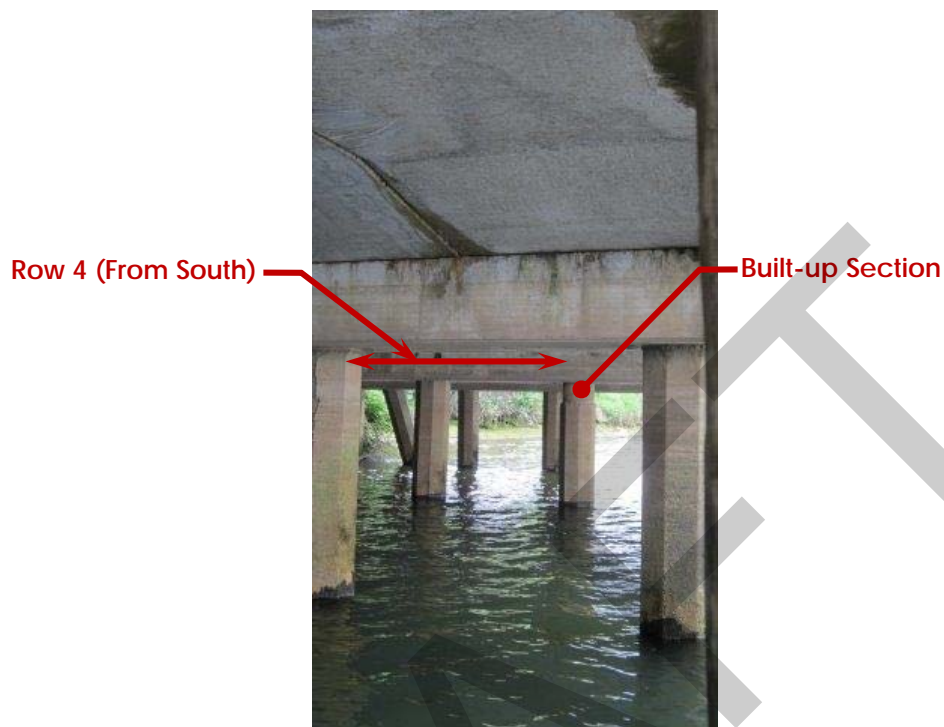


Photo ST16-09: Pile and Pilecaps

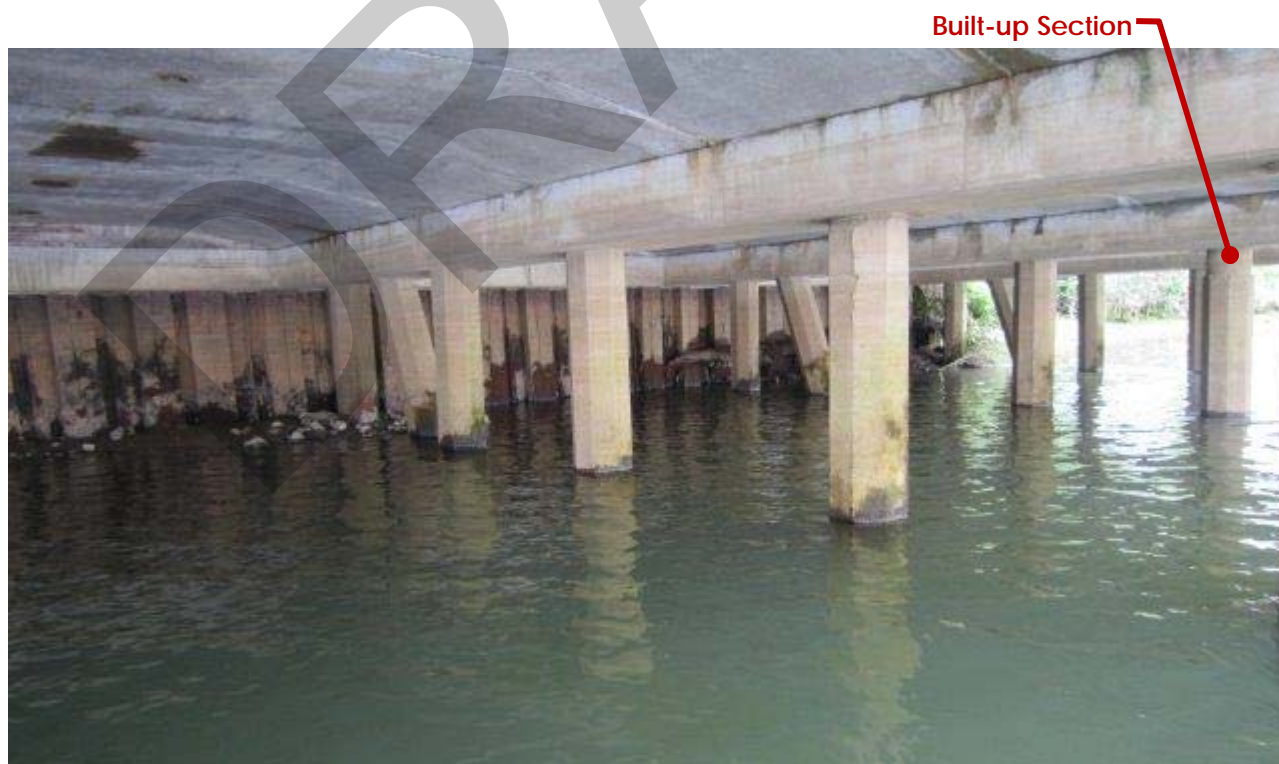


Photo ST16-10: Piles and Pile Caps (Looking Northwest)

PHOTOGRAPHS

Row 1 (South Most)

Row 2



Photo ST16-11: Piles and Pile Caps (Looking Southwest)



Photo ST16-12: Pier 3 Pier Deck

PHOTOGRAPHS



Photo ST16-13: Pier 4 Pier Deck



Photo ST16-014: Bulkhead and Pier Deck Soffit (Looking West)

PHOTOGRAPHS

Minor Chip

Pilecap



Photo ST16-15: Pier Deck Soffit



Photo ST16-016: Pier 4 Pier Deck (North Most, Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST17
Miscellaneous Piles-3
Parcel No. _____

WUS#: None

Facility Location: River Mile 3.9

Direction (side) West

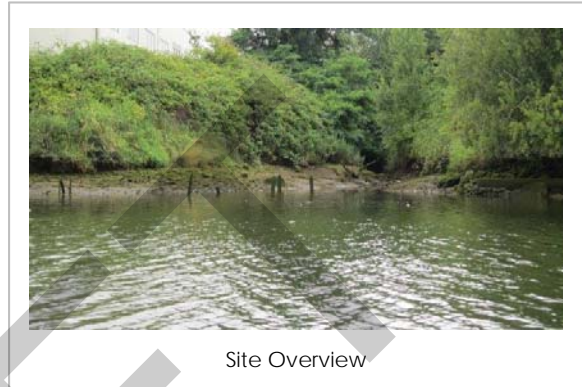
STA 468+00 to STA 471+50

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright

**General Condition and Evaluation:**

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photo 1).

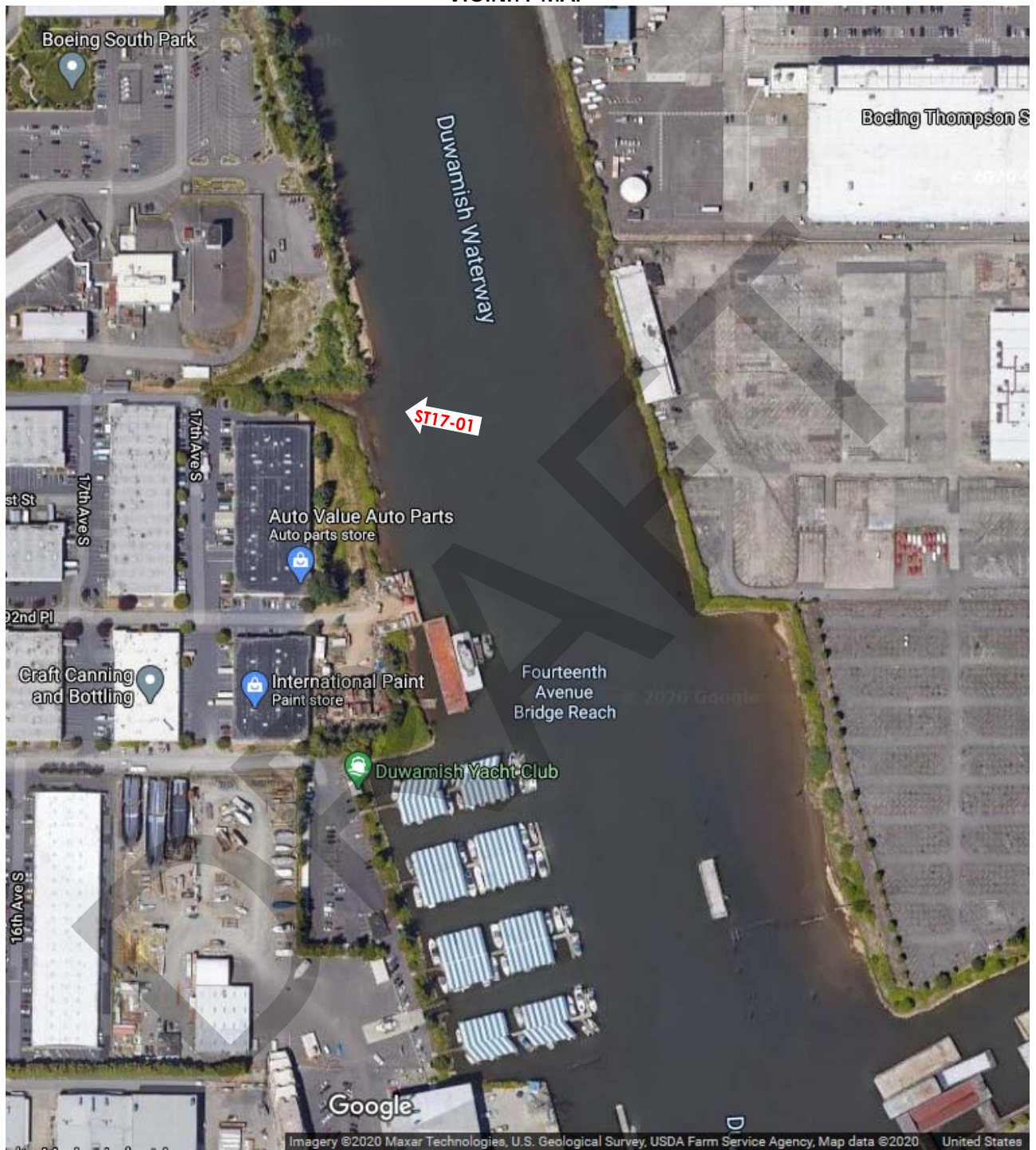
Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS



Photo ST17-01: Pile Field

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| 2. DISTRESS INDICATORS | X | Cracking or breakage |
|------------------------|---|-------------------------------------|
| | X | Rot and decay |
| | X | Surface deposits |
| | | Termite or Pest Infestation (Borer) |

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS
(Tripping, fall, fall through, slippery, impingement, and falling debris)

| 3A - Overall Apparent Alignment of Structure | | | | | | | |
|-----------------------------------------------------------------------------|------------------|--|-------------------------------------------------------------------------------------|---|-----------|--|-------------|
| | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| 3B - Surface Condition | | | | | | | |
| General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| Cracking | | | | X | | | |
| Loss of Material | | | | X | | | |
| Missing or broken members | | | | X | | | |
| Damage or distress | | | | X | | | |
| Collapse, partial collapse or structure off | | | | | | | |
| Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| Ground or slope movement present | | | | | | | |
| Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| Fasteners: Corrosion | | | | | | | |
| Soft timber and decay | | | | | | | |
| Abrasion | | | | | | | |
| Previous Repair | | | | | | | |
| Surface Coatings, Protective Systems | | | | | | | |
| Debris Buildup | | | | | | | |
| Structural Defects | | | | | | | |
| Moss | | | | | | | |

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST18
Miscellaneous Piles-4
Parcel No. _____

WUS#: None

Facility Location: River Mile 3.8

Direction (side) West

STA 473+00

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photo 1).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS



Photo ST18-01: Piles

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST19
Terminal 117 Cleanup Site

WUS#: 39

Facility Location: River Mile 3.5
Direction (side) West
STA 486+10 to STA 489+50

Asset Type: Steel Sheet Pipe Bulkhead

Use: Cleanup Containment

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were done at this site.

General

- Structure consists of U-shaped steel sheet pile bulkhead for contamination containment of Terminal 117 Cleanup Site.
- The piles appear to be in good condition. (Photos 1 to 4)
- The North and South return walls abut riprap river bank embankment. (Photos 1 to 4)
- Near the north end of the bulkhead, four (4) 12" diameter steel pipe guide piles support for a 16" diameter float debris deflection pile pipe. The piles and float are in good condition. (Photos 2 and 3)

Accessibility:

- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- The east side and parts of the north and south bulkhead are accessible by boat; the remaining portion of the north and south bulkhead is accessible by land.
- The debris deflection structure is accessible on both sides.

Potential Hazards:

- There are no overhead structures observed near the bulkhead.
- There are no overhead structures observed near the debris deflection structure.

VICINITY MAP



PHOTOGRAPHS



Photo ST19-01: South Return Wall (Looking Northwest)



Photo ST19-02: Debris Deflector Float (Looking Northwest)

PHOTOGRAPHS



Photo ST19-03: Debris Deflector Float (Looking Northwest)



Photo ST19-04: North Return Wall (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/04/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST20
South Park Marina
Parcel No. 2185600070

WUS#: 39

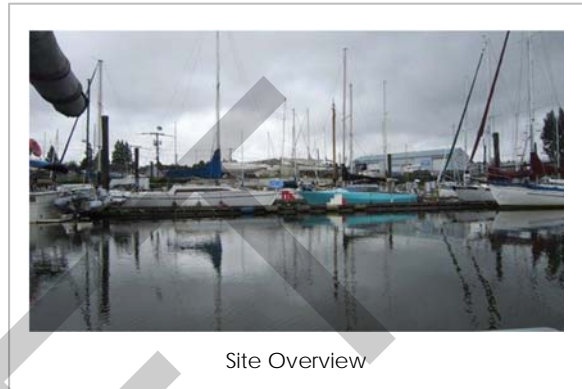
Facility Location: River Mile 3.3
Direction (side) West
STA 491+00 to STA 499+50

Asset Type: Marina

Use: Moorage of commercial and recreational vessels

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection of in-water structures was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas and on the floats.

The Marina consists of:

- A bulkhead along the west bank
- Gangway leading to the docks
- A primary floating walkway
- Three (3) parallel floating docks on the south and north sides of the primary walkway
- Finger piers on the west side of the west-most dock
- Timber guide piles; steel guide piles at the south ends of the south floating docks
- A boat ramp

Bulkhead

- The embankment consist of gravity concrete blocks (ecology type blocks) along the upper slope and rip rap along the toe of the slope. The wall appears to be four (4) blocks high (exposed height). The number of blocks below grade is unknown (Photos 1 to 5).
- There is evidence of significant ground settlement and lateral deflection along the entire length of the wall (Photos 2 to 7).

- At the north end, south of the boat ramp is a short length of lower gravity block wall which appear to be one (1) block high (Photo 6).
- The boat ramp is retained by gravity concrete block on the south side and concrete panels on the north side (Photos 6 and 7).

Gangway

- The galvanized steel pipe truss gangway is supported on the west end but the type and condition of the support is unknown (Photo 8).
- Utilities servicing the marina are hung on the west end of the gangway and fed from under the gangway. The integrity of the pull box cantenary supports is not known (Photos 9 and 10).
- There is scattered rust along the length of the truss members and corrosion at several welded joints (Photos 9 and 10).
- The wood walkway decking is worn and weathered but not distress was observed.
- The slip resistant grating over the decking appears to be in good condition.

Floating Docks

- The walkway, docks, and finger piers timber decking are worn and weathered. A number of planks appear to have been replaced, missing, re-fastened. Except for scattered dead or lost knots and checks no evidence of rot, moss growth, splinters, or perceptible deflection was observed (Photos 11 to 18).
- Utilities on the dock include power, water, and cable (Photo 13 and 14).

Float Guide

- The timber guide piles and preservative treatment appear to be sound in good condition except for moss build up around the splash zone (Photos 15 to 17).
- The steel guide piles appear to be newer than the timber piles. They are in good condition (Photo 18).
- The pile guides appear to be of different configurations. Damage consists of broken members, missing members, and abrasion (Photos 15 to 18).

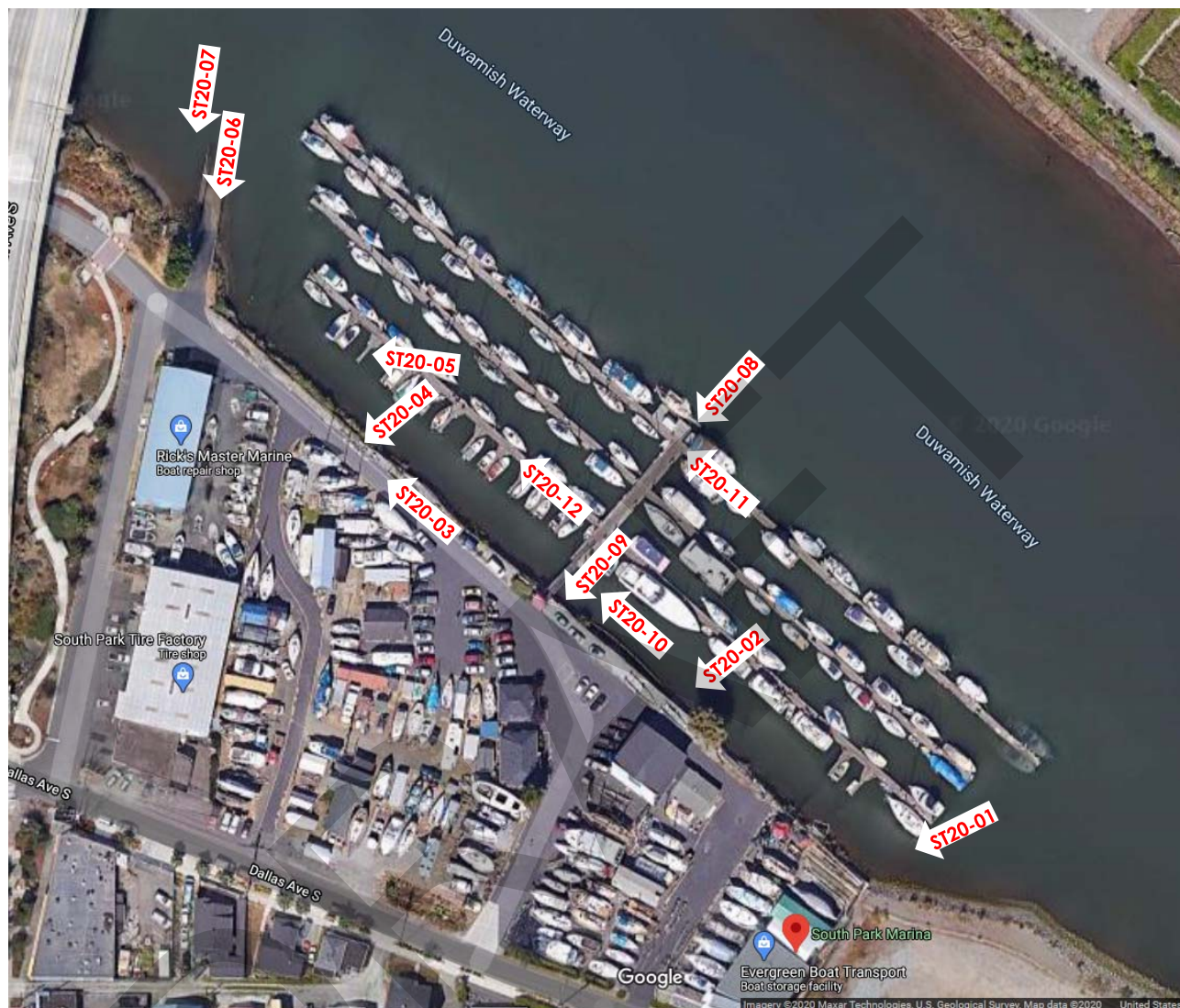
Accessibility:

- Accessibility depends on...
- The floating docks are accessible on all sides.
- The bulkhead and gangway are accessible from the land and water sides.

Potential Hazards:

- There are no overhead structures except for the gangway.
- The bulkhead appears to be generally unstable
- The condition or type of support or bulkhead under the gangway is unknown.

VICINITY MAP



* Photos 13 – 18 have not been called out above.

PHOTOGRAPHS



Photo ST20-01: Retaining Wall Bulkhead (Looking Northwest)



Photo ST20-02: Retaining Wall Bulkhead (Looking South West)

PHOTOGRAPHS



Photo ST20-03: Retaining Wall Bulkhead (Looking North)



Photo ST20-04: Close Up of Chain Tie Back

PHOTOGRAPHS

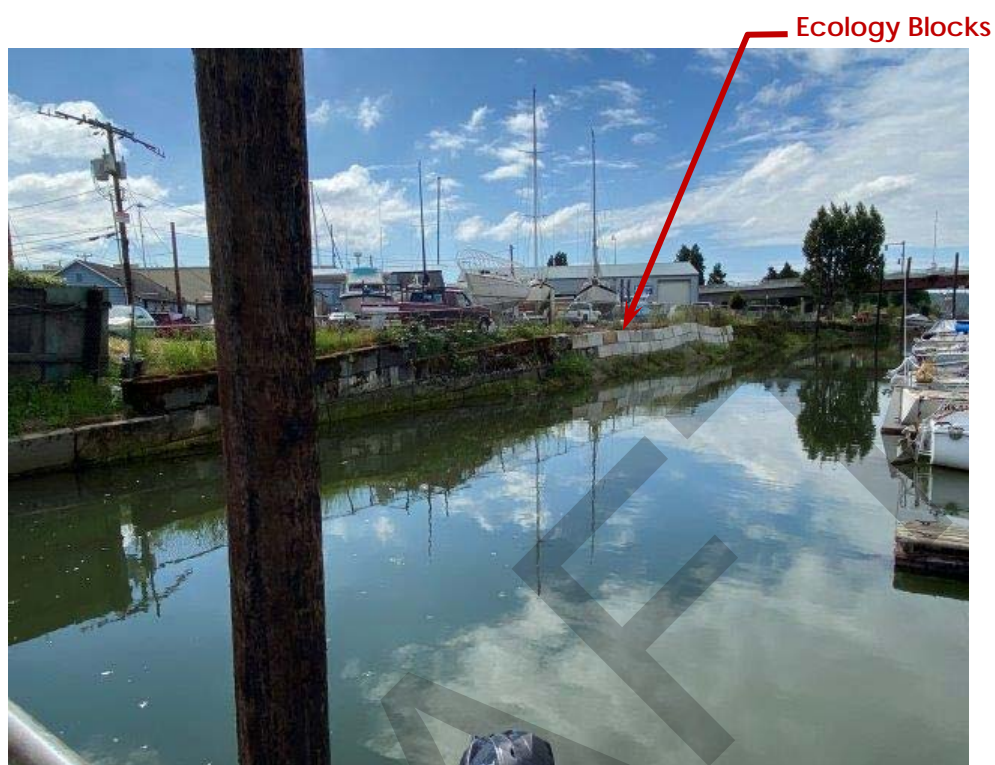


Photo ST20-05: Retaining Wall Bulkhead (Looking North)



Photo ST20-06: Boat Ramp (Looking Northwest)

PHOTOGRAPHS

Boat Ramp



Photo ST20-07: Boat Ramp (Looking West)

Gangway



Primary Walkway

Photo ST20-08: Gangway and Walkway (Looking West)

PHOTOGRAPHS

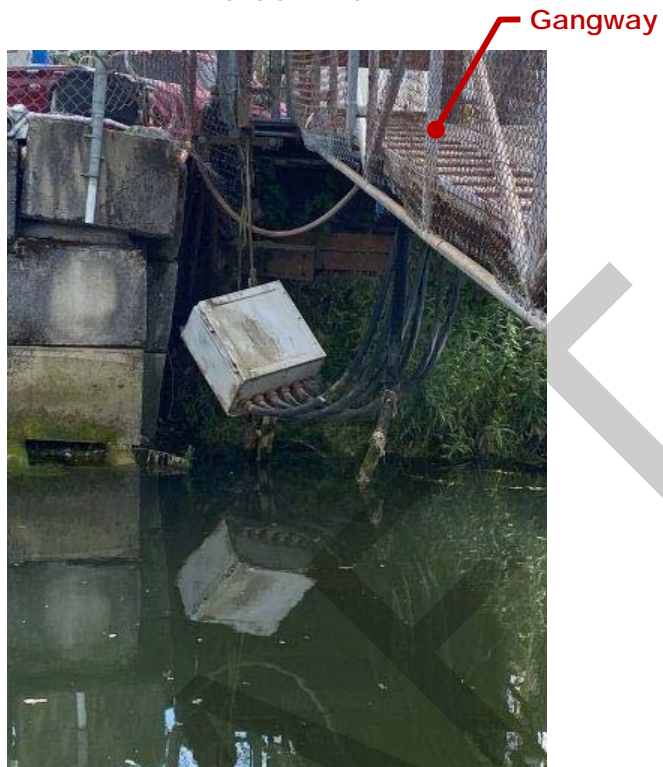


Photo ST20-09: Services (Looking West)

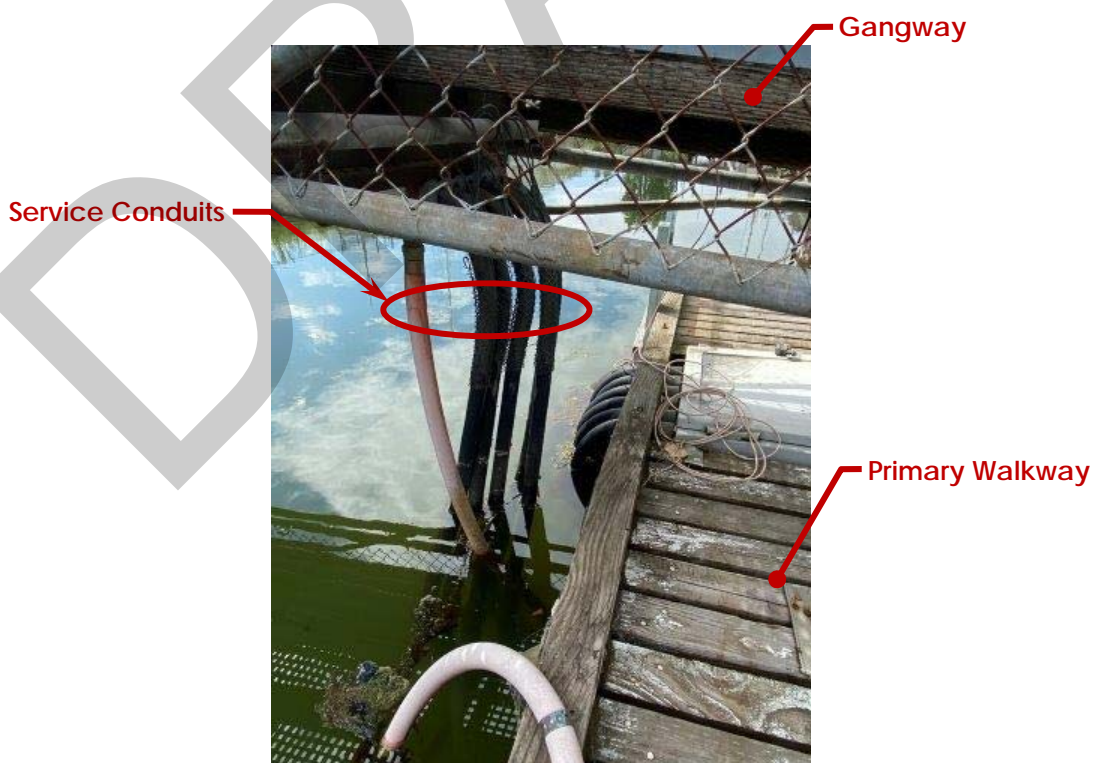


Photo ST20-10: Services (Looking North)

PHOTOGRAPHS



Photo ST20-11: Secondary Walkway (Looking North)



Photo ST20-12: West Secondary Walkway (Looking North)

PHOTOGRAPHS



Photo ST20-13: Utilities

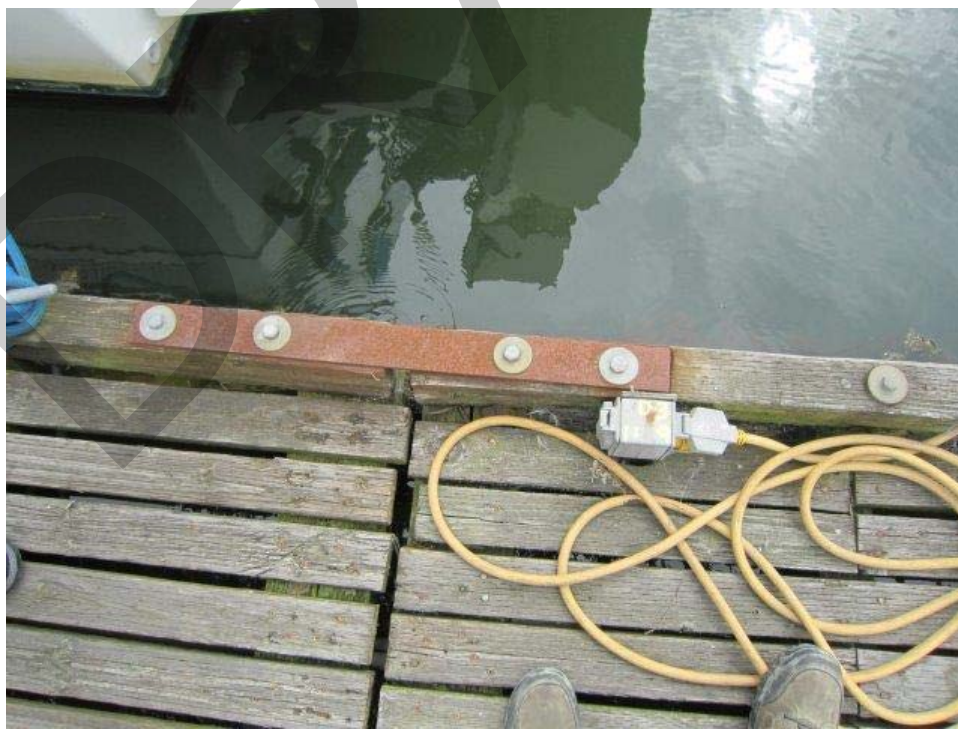


Photo ST20-014: Utilities

PHOTOGRAPHS

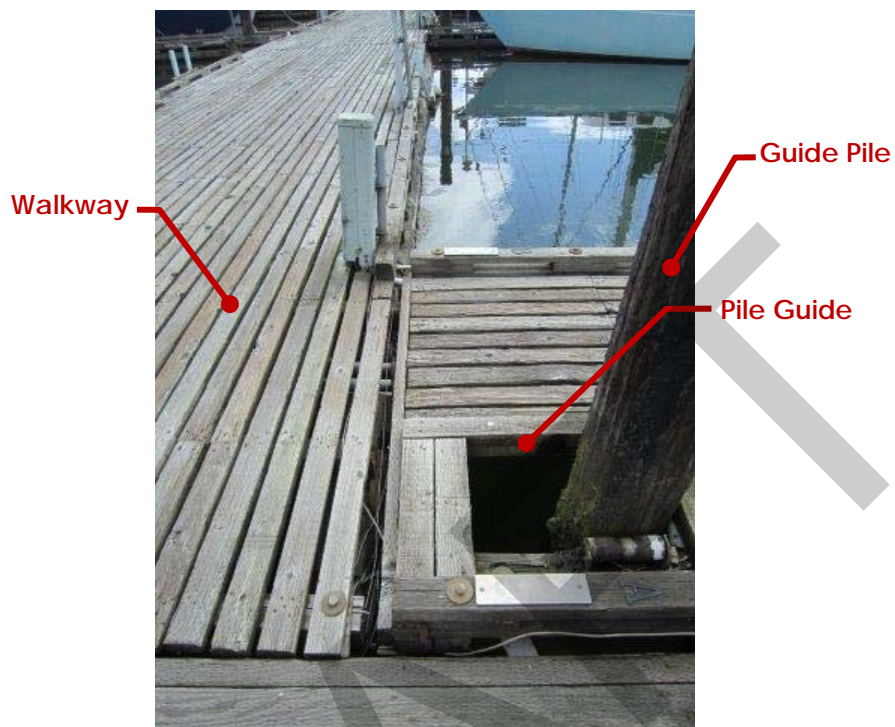


Photo ST20-15: Float Guide



Photo ST20-016: Float Guide

PHOTOGRAPHS

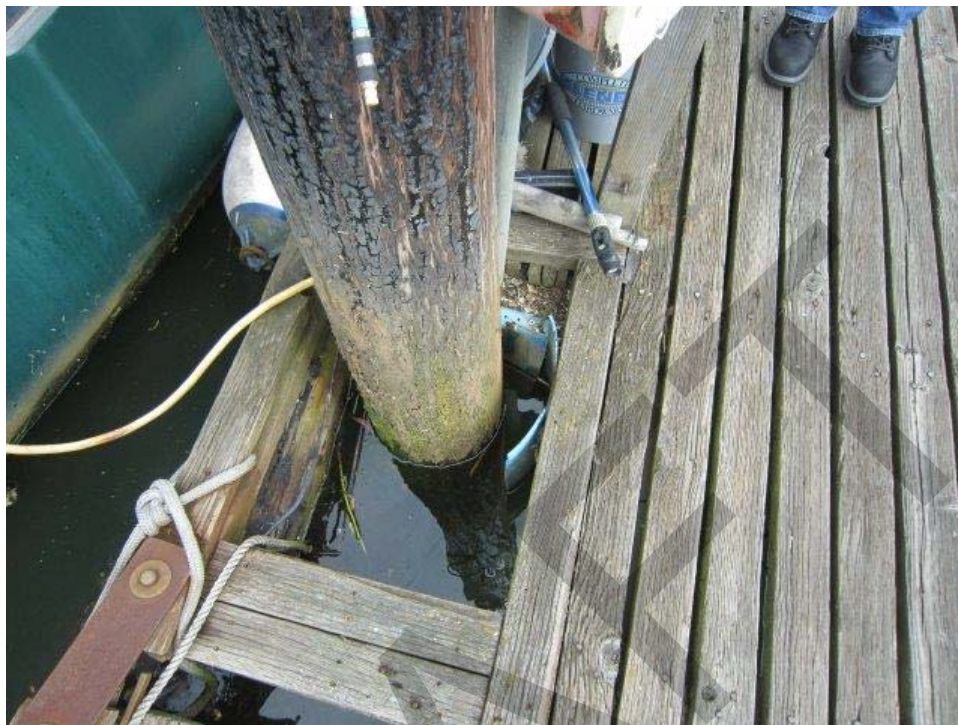


Photo ST20-17: Float Guide



Photo ST20-018: Float Guide

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/18/2020

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: ST21
Miscellaneous Piles-5
Parcel No. _____

WUS#: None

Facility Location: River Mile 3.0

Direction (side) West

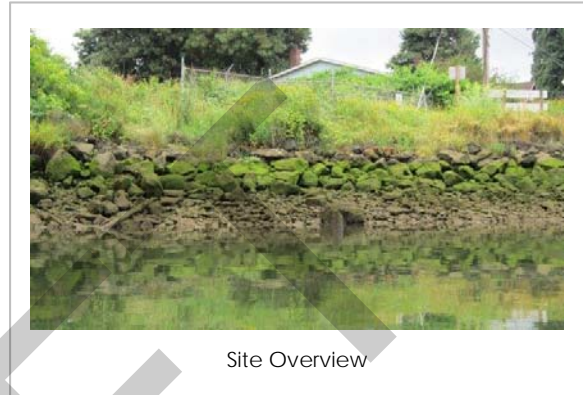
STA 503+50 to STA 520+50

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright

**General Condition and Evaluation:**

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photos 1 to 3).

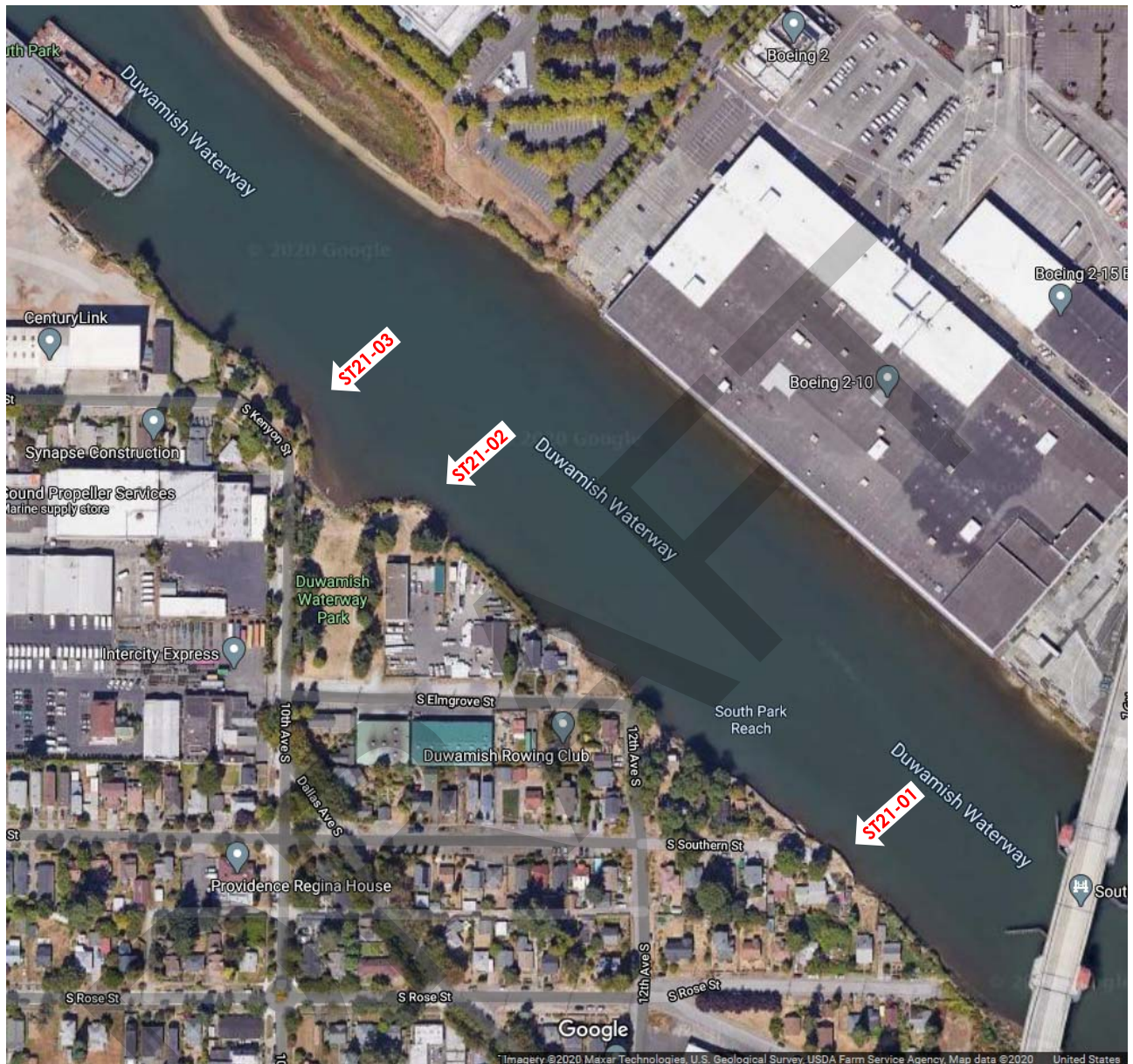
Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



Pile

PHOTOGRAPHS



Photo ST21-01: Southmost Pile Field

Pile



Photo ST21-02: Central Pile

PHOTOGRAPHS

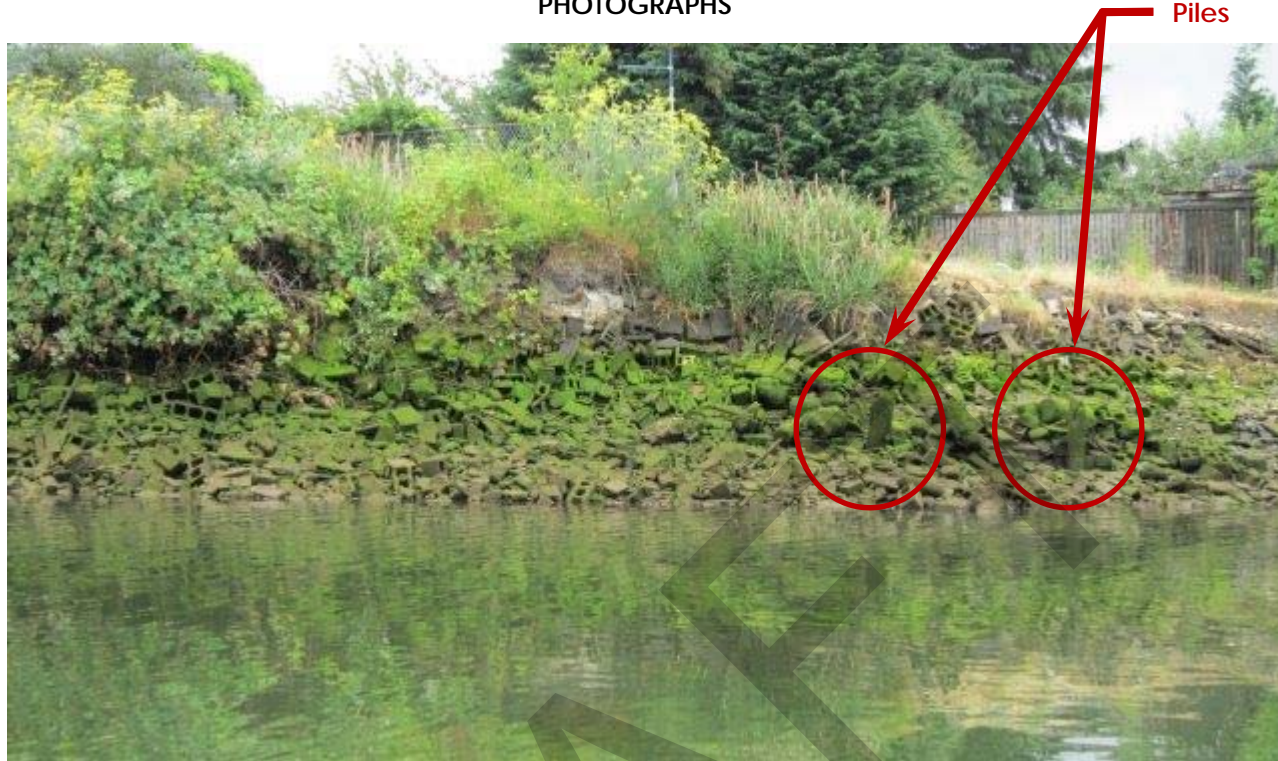


Photo ST21-03: Northmost Pile Field

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

| | | | | |
|----------------------------|---------------|----------------------------------------------------------------------------|------------------------------------|--------------------------------------|
| 1. ENVIRONMENTAL CONDITION | 1A – Exposure | | 1B – Soils (Foundation Conditions) | |
| | X | Environment (Marine, Freshwater, Industrial, etc.) | | Expansive soil |
| | | Freezing and thawing | | Compressive soil (settlement) |
| | X | Wetting and drying | | Evidence of pumping |
| | | Drying under dry atmosphere | | Scour |
| | | Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases) | | Steep or unstable slope/revetment |
| | X | Abrasion, erosion, impact | | |
| | | Heat from adjacent sources | | |

| | | |
|------------------------|---|-------------------------------------|
| 2. DISTRESS INDICATORS | X | Cracking or breakage |
| | X | Rot and decay |
| | X | Surface deposits |
| | | Termite or Pest Infestation (Borer) |

| | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|---|-------------------------------------------------------------------------------------|--|-----------|--|-------------|
| 3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris) | 3A - Overall Apparent Alignment of Structure | | | | | | | |
| | | Settlement | | Deflection/Leaning | | Expansion | | Contraction |
| | 3B – Surface Condition | | | | | | | |
| | General Condition | <u>Excellent</u> | | New or near-new condition: no issues to report. No loss of cross section. | | | | |
| | | <u>Good</u> | | Good condition: no reported issues or concerns. Less than 5% loss of cross section. | | | | |
| | | <u>Fair</u> | | Average wear; not new but no issues to report. Between 5% - 20% cross section. | | | | |
| | | <u>Poor</u> | | Worn from use: Between 20% - 50% loss of cross section. | | | | |
| | | <u>Critical</u> | | Extremely worn or damaged: Between 50% - 80% loss of cross section. | | | | |
| | Finished surfaces – slippery, uneven, or misaligned | | | | | | | |
| | Cracking | | X | | | | | |
| | Loss of Material | | X | | | | | |
| | Missing or broken members | | X | | | | | |
| | Damage or distress | | X | | | | | |
| | Collapse, partial collapse or structure off | | | | | | | |
| | Damage or decay of chimney, parapet or other overhead falling hazard | | | | | | | |
| | Ground or slope movement present | | | | | | | |
| | Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot | | | | | | | |
| | Fasteners: Corrosion | | | | | | | |
| | Soft timber and decay | | | | | | | |
| | Abrasion | | | | | | | |
| Previous Repair | | | | | | | | |
| Surface Coatings, Protective Systems | | | | | | | | |
| Debris Buildup | | | | | | | | |
| Structural Defects | | | | | | | | |
| Moss | | | | | | | | |

Appendix F

Attachment F-2 FCA Reports: Outfalls

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF01
Name
Parcel No. _____

Ecology ID: (Boeing 1)

Facility Location: River Mile 3.0

Direction (side) East

STA 253+00

Asset Type: Outfall with Duckbill Valve

Use: Marine Outfall

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve situated near shoreline, surrounded with riprap protection (Photo 1).
- Pipe material, size, and condition are unknown.
- Outfall is located at the north end of Boeing Plant 2 Building (Photo 2).
- Lower half of duckbill valve is open.

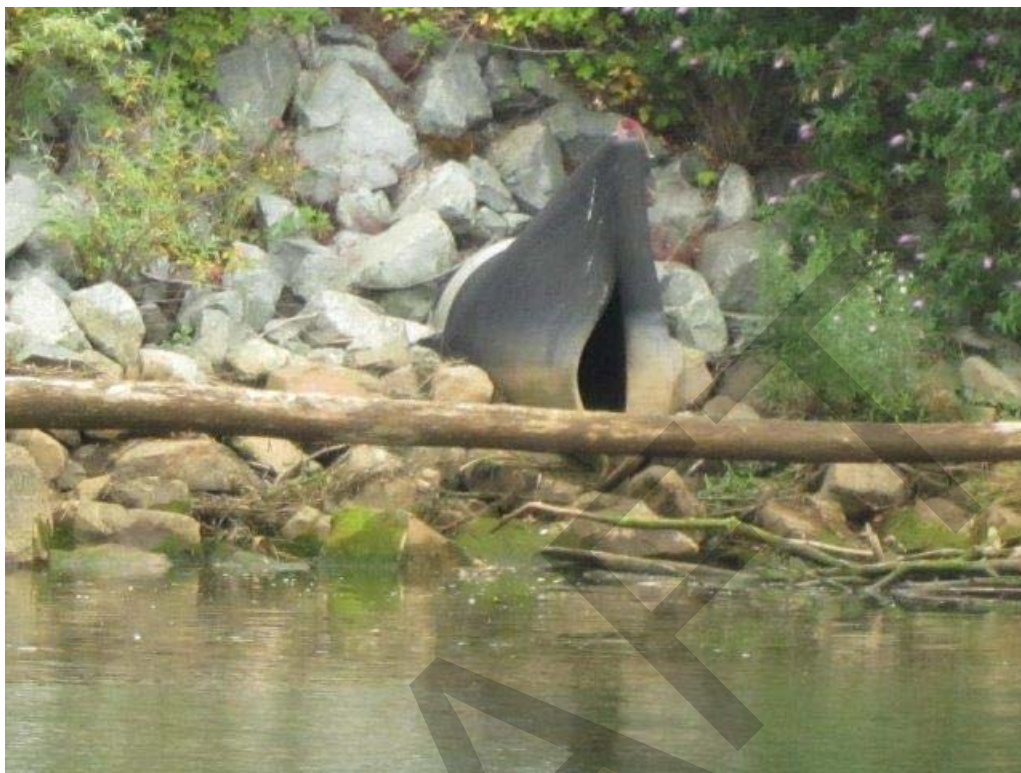
Accessibility:

- No obstruction is observed.

Potential Hazards:

- None noted.

PHOTOGRAPHS



Boeing Plant 2

OF01-01: Outfall North of Building



Outfall

OF01-02: North End of Building

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF02
Name
Parcel No. _____

Ecology ID: 3031

Facility Location: River Mile 3.2

Direction (side) East

STA 266+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall is located north of the South Park Bridge east piers and is situated on the riverbank surrounded with riprap (Photos 1 and 2).
- The outfall pipe is fitted with a duckbill valve, which appears not to be totally submerged at high tide (Photos 1 and 2).
- The pipeline size, material, and condition could not be observed and thus not known.

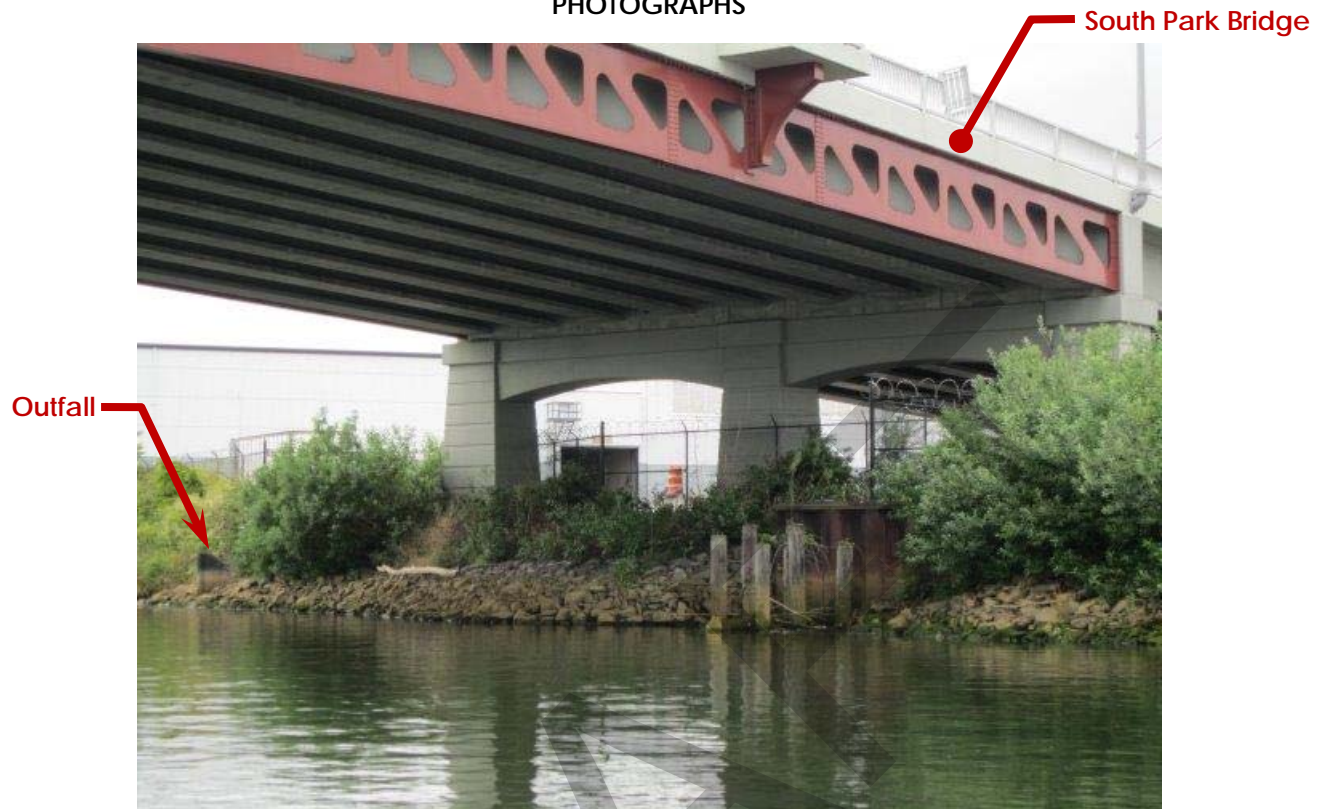
Accessibility:

- The outfall is accessible from the landside and with possible restricted accessibility from the water side.

Potential Hazards:

- The river bank is armored with riprap and appears to be stable.

PHOTOGRAPHS



OF02-01: Outfall (Looking Northeast)

OF02-02: Outfall (Looking Northeast)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF03
Name
Parcel No. _____

Ecology ID: 3032

Facility Location: River Mile 3.2

Direction (side) East

STA 267+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close-up observations were done.

The structure consists of:

- The outfall is located under and almost directly west of the South Park Bridge south pier. It projects several feet out of a 3-sided steel sheet pile bulkhead, and the projection is protected by three timber piles on the north and south sides. (Photos 1 and 2)
- The toe of the shoreline around the bulkhead is protected with riprap; however, support for the pipeline could not be observed.
- The pipeline size, material, and the condition, as well as the condition of the flap gate and timber rail, could not be observed.

Accessibility:

- The outfall appears accessible from the bulkhead and with restricted access from the river side.

Potential Hazards:

- Riprap armoring around the outfall, hence their stability, could not be observed.

South Park
Bridge Pier

PHOTOGRAPHS

Timber Piles

Outfall



Sheet Pile Bulkhead

OF03-01: Outfall Structure (Looking East)



OF03-02: Outfall Structure

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF04
Name
Parcel No. _____

Ecology ID: 2065

Facility Location: River Mile 3.6

Direction (side) East

STA 289+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete outfall end approximately flush with steel sheet pile bulkhead (Photo 1).
- The size, support, and condition of the outfall could not be observed.

Accessibility:

- Outfall is unobstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



OF04-01: Concrete Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF05
Name
Parcel No. _____

Ecology ID: 2064

Facility Location: River Mile 3.6

Direction (side) East

STA 289+80

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete outfall end approximately flush with steel sheet pile bulkhead (Photo 1).
- It appears that the outfall is plugged.
- The size, support, and condition of the outfall could not be observed.

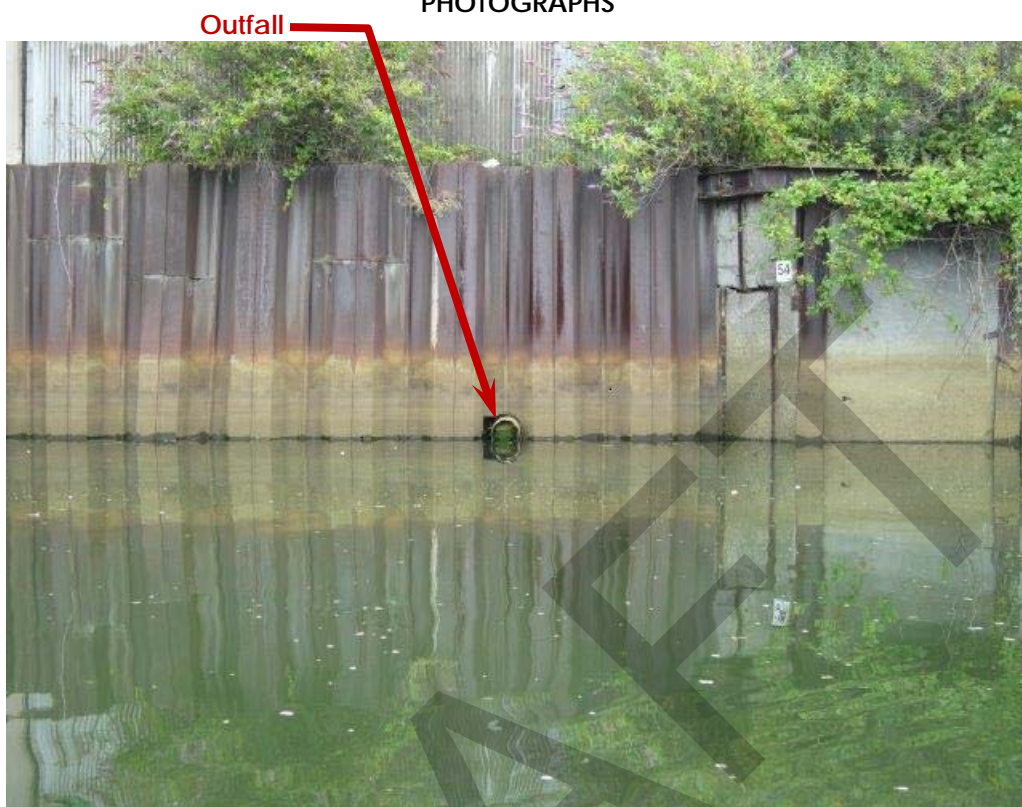
Accessibility:

- Outfall is unobstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



OF05-01: Concrete Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF06
Name
Parcel No. _____

Ecology ID: 2061

Facility Location: River Mile 3.7

Direction (side) _____

East STA 296+30

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete outfall projecting a few feet outside the steel sheet pile bulkhead (Photo 1).
- The size, support, and condition of the outfall could not be observed.
- It appears that the outfall is plugged.

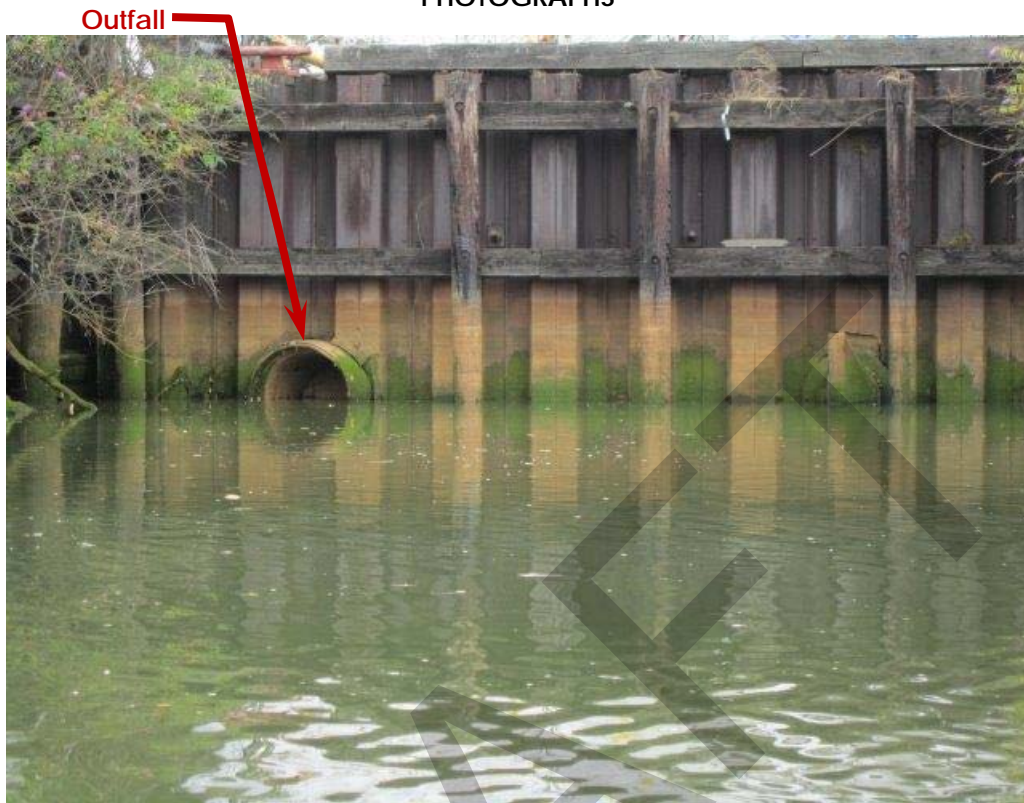
Accessibility:

- Outfall is not obstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



OF06-01: Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF07
Name
Parcel No. _____

Ecology ID: 2077

Facility Location: River Mile 3.7

Direction (side) _____

East STA 301+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall diffuser with duckbill valve and concrete armoring (Photo 1). It is not clear if upstream part of the outfall is a conduit.
- It appears that the outfall is supported on timber piles along the shoreline (Photos 1 and 2).

Accessibility:

- Outfall is accessible from the water side.

Potential Hazards:

- None.

PHOTOGRAPHS



OF07-01: Outfall



OF07-02: Shoreline Timber Pile Bulkhead

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF08
Name
Parcel No. _____

Ecology ID: 2073

Facility Location: River Mile 3.8

Direction (side) _____

East STA 307+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete outfall supported on concrete apron, protected with an inverted, 3-sided concrete box and riprap (Photos 1 and 2).
- It appears the outfall is plugged.

Accessibility:

- Outfall is accessible on the water side.

Potential Hazards:

- None observed.

PHOTOGRAPHS

Outfall Box



OF08-01: Outfall Box



OF08-02: Close Up of Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF09
Name
Parcel No. _____

Ecology ID: 2080

Facility Location: River Mile 4.1

Direction (side) East

STA 324+60

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve surrounded by riprap. The pipe size, material and support were not observed (Photo 1).

Accessibility:

- There are no obstructions around the outfall.

Potential Hazards:

- None observed.

PHOTOGRAPHS



Photo OF09-01: Outfall (Looking North)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF10
Name
Parcel No. _____

Ecology ID: 2081

Facility Location: River Mile 4.2

Direction (side) East

STA 327+80

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Outfall



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve and riprap protection projects a few feet beyond the shoreline. The pipe size, material, and support condition were not observed (Photo 1).

Accessibility:

- No obstruction observed.

Potential Hazards:

- Support stability of pipe overhang is beyond the riprap shoreline.

PHOTOGRAPHS



Photo OF10-01: Outfall (Looking North)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF11
Name
Parcel No. _____

Ecology ID: 2082

Facility Location: River Mile 4.2

Direction (side) East

STA 337+00

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor



Site Overview
(beneath Slip 6 piers)

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve surrounded with riprap and slightly overhangs beyond the shoreline. The pipe size, material, and support condition were not observed (Photo 1).
- Located in Clip 6 under the wharf between piers 4 and 5.

Accessibility:

- Outfall located under the wharf and between piers therefore access may be limited.

Potential Hazards:

- Overhead wharfs between piers 4 and 5.

PHOTOGRAPHS



Photo OF11-01: Outfall Between Piers 4 and 5 (Looking South)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF12
Name
Parcel No. _____

Ecology ID: 2089

Facility Location: River Mile 4.3
Direction (side) East
STA 347+40

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with armor and corrugated steel encased concrete collar is projected beyond the shoreline. It does not appear that riprap surrounds the outfall (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- Support of the outfall projection was not observed.

PHOTOGRAPHS



Photo OF12-01: Outfall (Looking Southeast)



Photo OF12-02: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF13
Name
Parcel No. _____

Ecology ID: 2088

Facility Location: River Mile 4.3

Direction (side) East

STA 349+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

**General Condition and Evaluation:**

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall at shoreline with riprap on two sides of the pipe (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- Support beneath the outfall was not verified.

PHOTOGRAPHS



Photo OF13-01: Outfall North of Dolphin (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF14
Name
Parcel No. _____

Ecology ID: (BDC - 1)

Facility Location: River Mile 4.3

Direction (side) East

STA 349+50

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

**General Condition and Evaluation:**

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall is encased with concrete and projects slightly beyond the shoreline. It is surrounded with riprap (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- Support beneath the outfall was not verified.

PHOTOGRAPHS



Photo OF13-01: Outfall South of Dolphin (Looking East)



Photo OF12-02: Outfall South of Dolphin (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF15
Name
Parcel No. _____

Ecology ID: 2087

Facility Location: River Mile 4.4

Direction (side) East

STA 351+20

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Boeing
Building

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve projecting from the riprap armor (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- None noted.

PHOTOGRAPHS



Photo OF15-01: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF16
Name
Parcel No. _____

Ecology ID: 2090

Facility Location: River Mile 4.5

Direction (side) East

STA 358+80

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve at the shoreline, surrounded with riprap (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- Condition of support beneath the outfall was not be observed.

PHOTOGRAPHS



Photo OF16-01: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF17
Name
Parcel No. _____

Ecology ID: 2092

Facility Location: River Mile 4.8

Direction (side) East

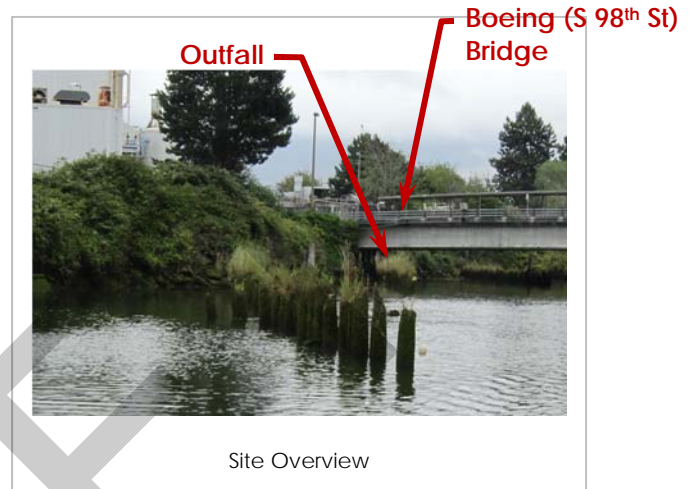
STA 370+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

**General Condition and Evaluation:**

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall pipe projecting beyond the shoreline and surrounded with riprap and concrete panel rubbles (Photo 1).
- Pipe size, material, and support condition were not observed (Photo 2).

Accessibility:

- No obstructions observed.
- In proximity of groin timber piles that are not in a sound location.

Potential Hazards:

- Condition of support beneath the outfall was not be observed.

PHOTOGRAPHS

S 98th Street

(Boeing) Bridge

Groin Timber Piles

Outfall



Photo OF17-01: Outfall (Looking East)



Photo OF17-02: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF18
Name
Parcel No. _____

Ecology ID: 2094

Facility Location: River Mile 4.9

Direction (side) East

STA 375+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall projects a few feet past the shoreline. Protected with what appears to be riprap and concrete debris (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.
- In proximity of groin timber piles that are not in a sound location.

Potential Hazards:

- Condition of support beneath the outfall was not be observed.

PHOTOGRAPHS



Photo OF18-01: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF19
Name
Parcel No. _____

Ecology ID: Norfolk CSO

Facility Location: River Mile 4.9

Direction (side) East

STA 376+30

Asset Type: Combined Sewer Overflow (CSO)

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete culvert consists of head wall, wing walls, and flow control cast iron flap gate. Concrete apron was not observed.
- The condition of the culvert could not be observed.

Accessibility:

- The culvert is recessed into the embankment and between timber retaining walls. Accessibility is limited.

Potential Hazards:

- Condition of support beneath the culvert and stability of the retaining walls was not be observed.

PHOTOGRAPHS

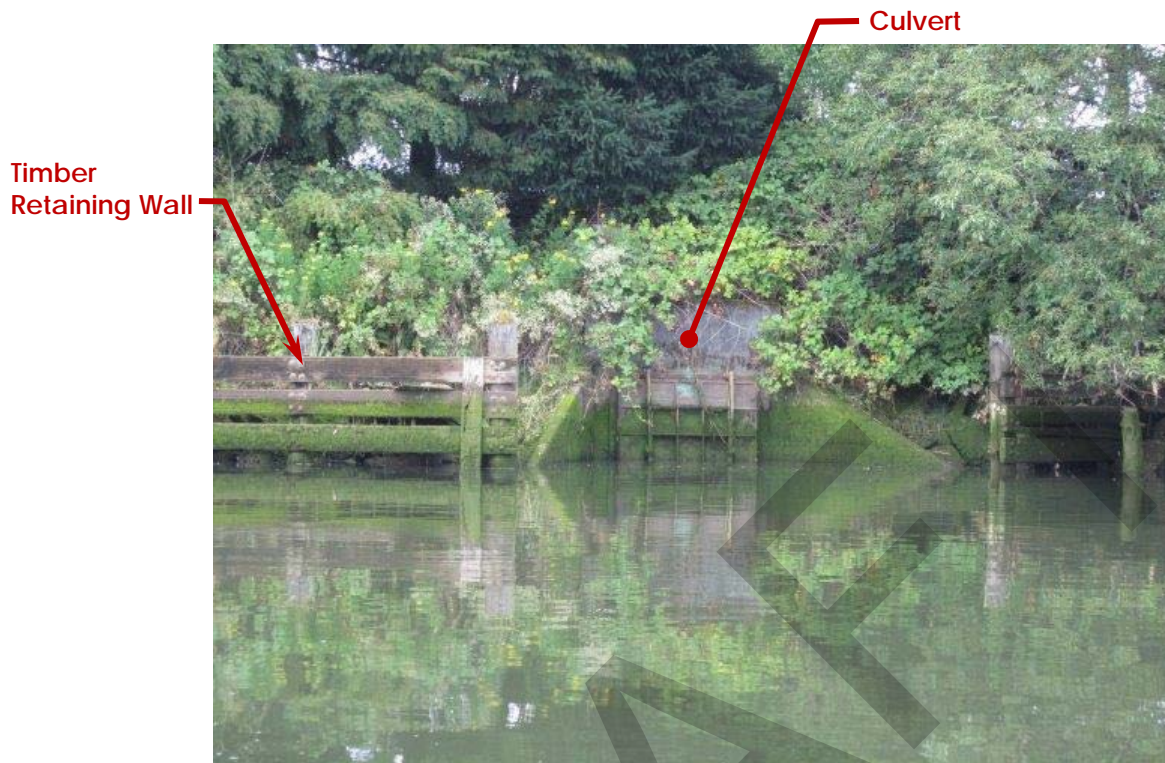


Photo OF19-01: Culvert (Looking East)

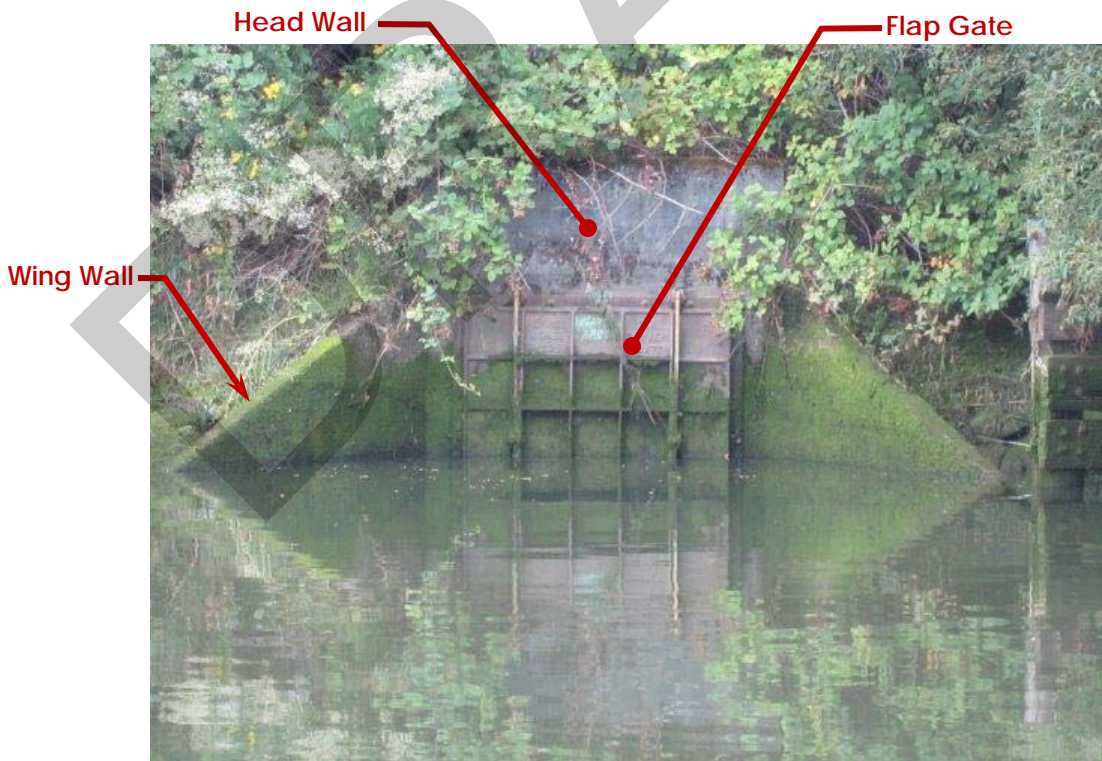


Photo OF19-02: Close Up of Culvert

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/26/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF20
Name
Parcel No. _____

Ecology ID: Ditch #2

Facility Location: River Mile 4.9

Direction (side) West

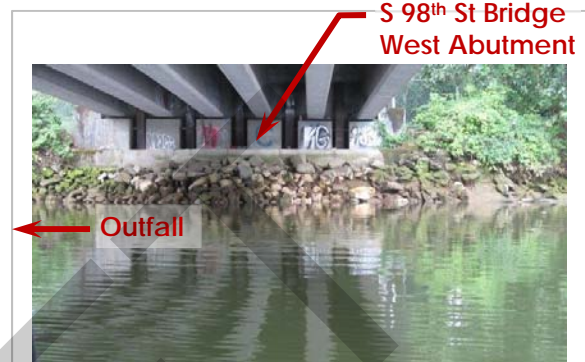
STA 387+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with a duckbill valve is nested in the bushes over the shoreline and appears to be surrounded with riprap (Photos 1 and 2).
- The valve appears to be open (Photo 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- None observed.

PHOTOGRAPHS

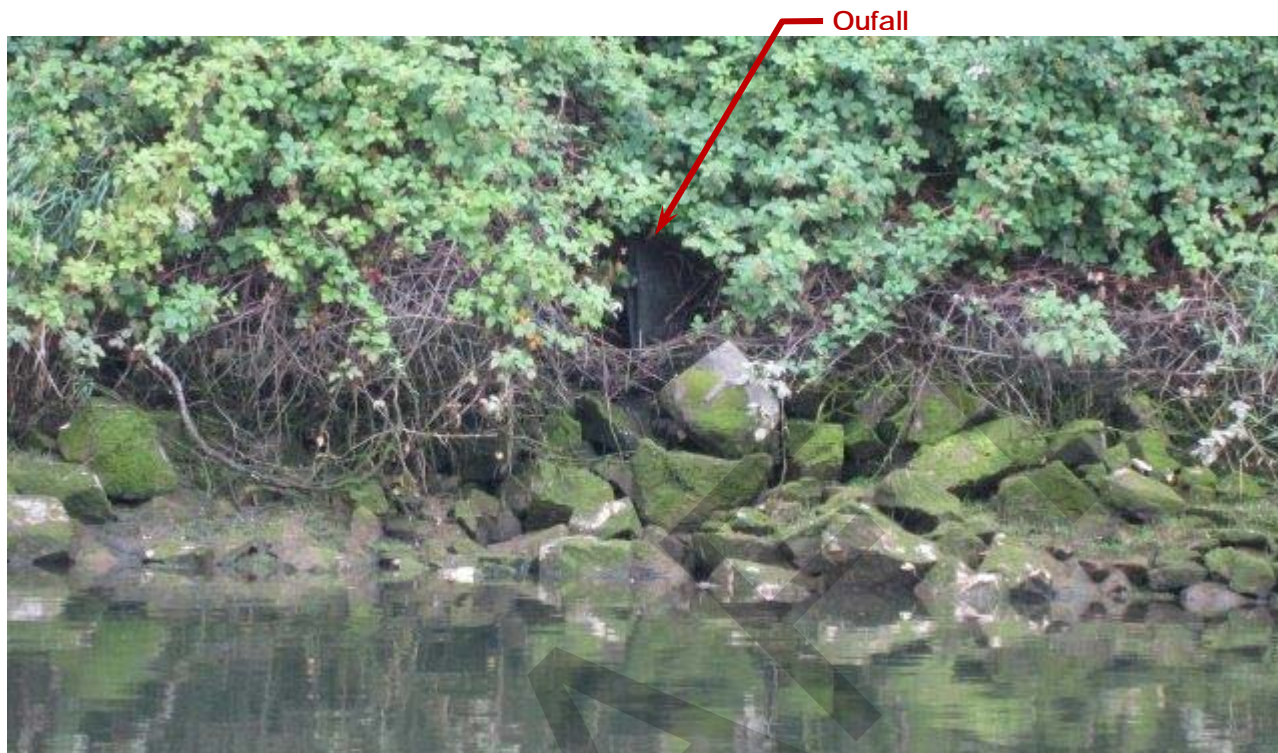


Photo OF20-01: Outfall (Looking West)



Photo OF20-02: Enlarged Outfall Valve

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF21
Name
Parcel No. _____

Ecology ID: 2098

Facility Location: River Mile 4.4

Direction (side) West

STA 433+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Corrugated steel pipe projecting several feet beyond the shoreline surrounded by riprap (Photos 1 and 2).
- Moss growth around the pipe (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potential Hazards:

- Overhead electrical power transmission lines.

PHOTOGRAPHS



Photo OF21-01: Outfall (Looking West)



Photo OF21-02: Outfall (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF22
Name
Parcel No. _____

Ecology ID: 2100B

Facility Location: River Mile 4.1

Direction (side) West

STA 454+00

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Delta Marine Industries

Outfall



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Corrugated steel pipe projecting between soldier pile wall with a bend (Photos 1 and 2).
- Moss growth around the pipe (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- Limited by the width between adjacent structures and guide piles.

Potential Hazards:

- Support beneath the pipe was not observed.
- Adjacent floating decks and guide piles.

PHOTOGRAPHS



Photo OF22-01: Outfall at Higher Tide Level



Photo OF22-02: Outfall at Lower Tide Level

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF23
Name
Parcel No. _____

Ecology ID: (SP3)

Facility Location: River Mile 3.7

Direction (side) West

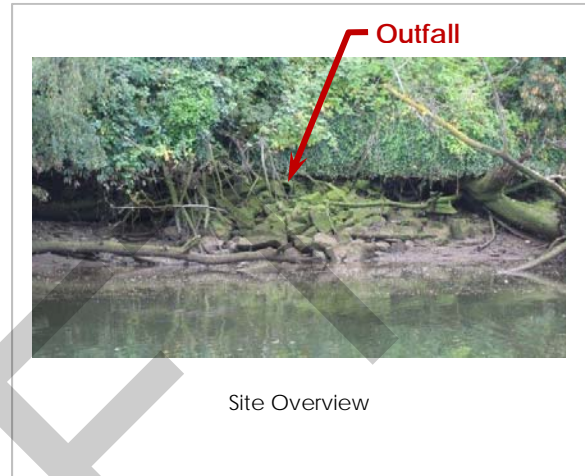
STA 477+70

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall projects into the shoreline and is supported on a mound of riprap (Photos 1 and 2).
- Size, material, and condition were not observed closely.

Accessibility:

- Minor obstruction consists of dead branches around the outfall.

Potential Hazards:

- None observed.

PHOTOGRAPHS

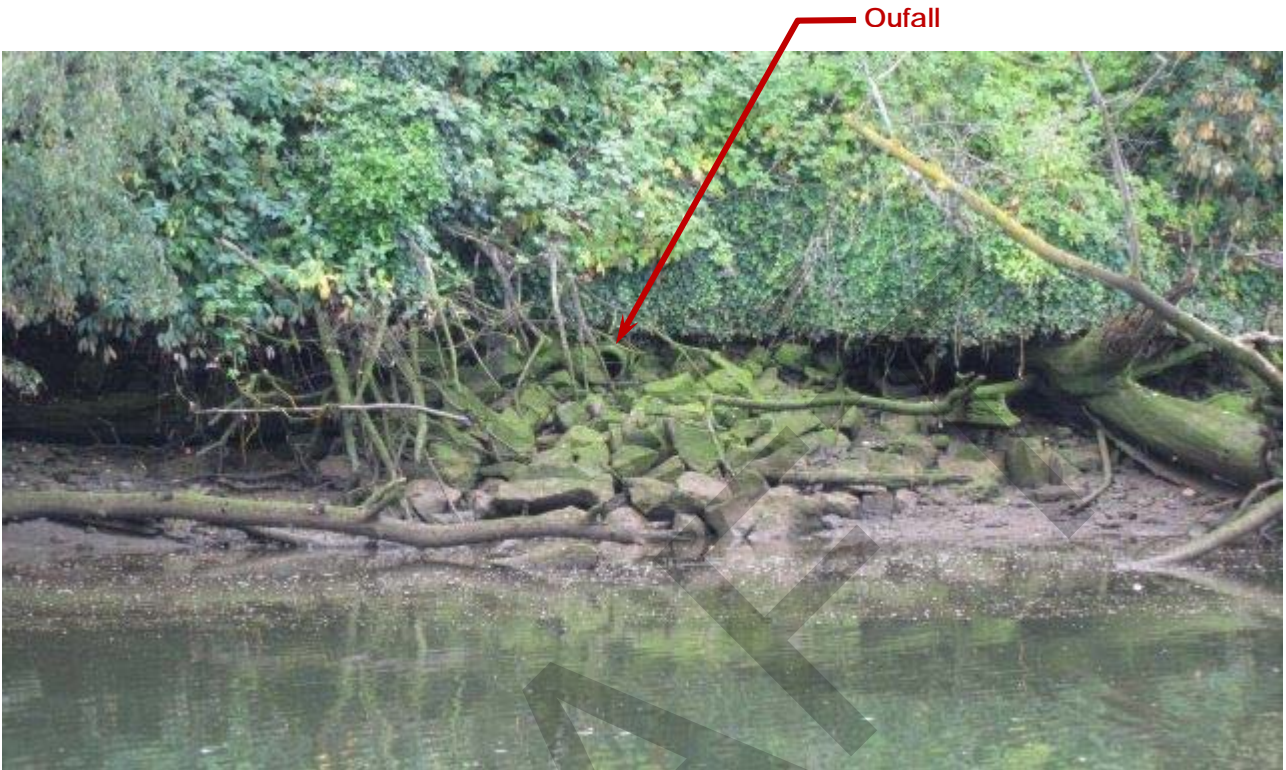


Photo OF23-01: Outfall (Looking West)



Photo OF23-02: Close Up of Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF24
Name
Parcel No. _____

Ecology ID: 2214

Facility Location: River Mile 3.5

Direction (side) West

STA 492+20

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall projects beyond the riprap shoreline (Photo 1).
- Size, material, and condition were not observed closely.

Accessibility:

- No obstruction is observed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



Photo OF24-01: Outfall (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF25
Name
Parcel No. _____

Ecology ID: 2215

Facility Location: River Mile 3.3

Direction (side) West

STA 500+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Boat Ramp at
South Park Marina

Outfall



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve near the shoreline supported on a mound of quarry spalls (Photos 1 to 3).
- Size, material, and condition were not observed closely.

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

PHOTOGRAPHS

Boat Ramp



Photo OF25-01: Outfall (Looking West)

Steel Gangway

Outfall



Photo OF25-02: Outfall (Looking Northwest)

PHOTOGRAPHS



Photo OF25-03: Outfall (Looking Southwest)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/21/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway

Facility Name: OF26 (VERIFY IF THIS IS AN OUTFALL)
Name
Parcel No. _____

Ecology ID: 3037

Facility Location: River Mile 3.2

Direction (side) West

STA 508+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with flapgate nestled within rockery wall (Photo 1).
- Size, material, and condition were not observed closely.

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



Photo OF26-01: Outfall (Looking West)